FINAL

ENVIRONMENTAL ASSESSMENT
FOR INCREASING ROUTINE FLIGHTLINE ACTIVITIES
EDWARDS AIR FORCE BASE, CALIFORNIA

August 2009

Approved for public release; distribution is unlimited.

95th Air Base Wing
Environmental Management Directorate
Edwards Air Force Base, California

CH2-AFC-SRPT-09216-0001

FINAL

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
08/24/2009	Final	February 2008 to June 2009

4. TITLE AND SUBTITLE

Environmental Assessment for Increasing Routine Flightline Activities, Edwards Air Force Base, California; and the Finding of No Significant Impact (FONSI)

5a. CONTRACT NUMBER
F42650-01-C-7218

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Verlyn Newby, JT3/CH2M HILL

5d. PROJECT NUMBER
Control No. 98-7

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)
JT3/CH2M HILL
190 S Wolfe, Building 1260
Edwards AFB, California 93524

8. PERFORMING ORGANIZATION REPORT NUMBER
CH2-AFC-SRPT-09216-0001

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
95 ABW/EM
5 East Popson Avenue, Building 2650A
Edwards AFB, California 93524

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
CC: 012100 CA: AFFTC, Edwards AFB CA

14. ABSTRACT
This environmental assessment evaluates the environmental consequences of implementing two project alternatives for increasing routine flightline activities. This assessment was requested by the 95th Air Base Wing Environmental Management Directorate, Edwards Air Force Base, California. The project was conducted from February 2008 through June 2009 by JT3/CH2M HILL. The Proposed Action would increase flightline activities to support current and future Air Force Flight Test Center missions. The No Action Alternative would be to continue flightline activities at present levels and as described in the 1997 programmatic Environmental Assessment. Impacts to the environmental condition were evaluated and mitigation measures to minimize the effects were presented. All projects would be conducted in compliance with all Air Force instructions.

15. SUBJECT TERMS
Environmental Assessment ; Runway; Flightline; Ground Activities; Maintenance; Operational Activities; Logistics; Support

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Robert W. Wood
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	80	19b. TELEPHONE NUMBER *(include area code)* 661-277-1407

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

This page intentionally left blank.

FINAL
FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR ENVIRONMENTAL ASSESSMENT FOR INCREASING ROUTINE FLIGHTLINE ACTIVITIES AT EDWARDS AIR FORCE BASE, CALIFORNIA

1.0 INTRODUCTION

The Air Force has prepared an environmental assessment (EA) evaluating the potential impact of proposed increases in routine flightline activities. The proposed action is to increase routine flightline activities at the Air Force Flight Test Center (AFFTC) on Edwards Air Force Base (AFB), California. Flightlines at Edwards AFB include Main Base, North Base, South Base, Rosamond and Rogers Dry Lakes, and locations designated for use as airfields in the *General Plan, Edwards Air Force Base, California* (95th Air Base Wing, 2009c). Routine flightline activities include: conducting ground tests of manned and unmanned aircraft/aerial vehicles, conducting flight evaluation, supporting recovery operations of aerospace research vehicles, and developing and testing aerodynamic decelerators (e.g., parachute systems). Additionally, flightline activities include operating the United States Air Force Test Pilot School; planning and conducting worldwide airborne research; developing telemetry acquisition and systems flight testing methods; providing support operations; supporting recreational activities; and supporting Department of Defense (DOD), other governmental agencies, and foreign and contractor developmental test and evaluation programs.

A No Action alternative was also evaluated. Under the no action alternative, routine flightline activities would not increase and no unanticipated environmental impacts would occur as a result of present levels of routine flightline activities.

2.0 ANTICIPATED ENVIRONMENTAL EFFECTS

Additional routine flightline activities occurring under the proposed action are not expected to significantly alter the productivity of the environment. The EA analyzed several components of the natural and manmade environment for potential impacts as a result of the proposed action. The potential impacts to the following were evaluated: land use, air quality, water resources, safety and occupational health, hazardous materials/waste, solid waste, biological resources, geology and soils, socioeconomic, infrastructure, and energy resources. No potentially significant impacts were identified.

Under the No Action alternative, routine flightline activities would continue as described in the 1997 *Programmatic Environmental Assessment for Routine Flightline Activities, Edwards Air Force Base, California* (AFFTC, 1997a).

3.0 FINDINGS

Based on the EA, conducted in accordance with the requirements of the *National Environmental Policy Act of 1969 (NEPA)*, as amended (Title 42 United States Code Section 4321 et seq.); Council on Environmental Quality regulations for implementing the procedural provisions of *NEPA* (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508); and Air Force Instruction 32-7061, *The Environmental Impact Analysis Process (EIAP)*, as promulgated in 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*, the environmental impacts of increasing routine

flightline activities at Edwards AFB would not be expected to be significant and the preparation of an environmental impact statement is not warranted. Background information that supports the research and development of this FONSI and the EA is on file at Edwards AFB, and can be obtained by contacting the following:

95th Air Base Wing
Environmental Management
Attn: Mr. Gary Hatch
5 East Popson Avenue
Edwards Air Force Base, California 93524-8060
(661) 277-1454

Robert W. Wood

ROBERT W. WOOD, Director
Environmental Management

24 Aug 09
Date

FINAL

COVER SHEET

ENVIRONMENTAL ASSESSMENT FOR INCREASED ROUTINE FLIGHTLINE ACTIVITIES, EDWARDS AIR FORCE BASE, CALIFORNIA

a. Lead Agency: U.S. Air Force

b. Cooperating Agency: None

c. Proposed Action: Increase Routine Flightline Activities at Edwards Air Force Base

d. Inquiries on this document should be directed to the 95th Air Base Wing Environmental Management Directorate, Attn: Gary Hatch, 5 East Popson Avenue, Edwards Air Force Base, California 93524-8060, (661) 277-1454 or e-mail: gary.hatch@edwards.af.mil.

e. Designation: Final Environmental Assessment (EA)

f. Abstract: Pursuant to the *National Environmental Policy Act of 1969*, this EA has been prepared to analyze the potential environmental consequences of the proposed action and provide an environmental baseline for routine flightline activities. The Air Force Flight Test Center, Edwards Air Force Base (AFB), California, proposes to increase routine flightline activities to support new test missions that will operate at Edwards AFB. Routine flightline activities consist of the continued use of designated flightline areas that include, but are not limited to, Main Base, North Base, South Base, and lakebed areas for the fulfillment of Department of Defense, other governmental agencies, and foreign and contractor developmental test and evaluation programs, and the maintenance and support activities necessary to carry out these programs. Adherence to all applicable federal, state, and local laws and regulations, and Air Force Instructions would ensure no significant environmental impact would occur as a result of this project.

This page intentionally left blank.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Concluded)

LIST OF FIGURES

LIST OF TABLES

This page intentionally left blank.

LIST OF ABBREVIATIONS AND ACRONYMS

95 ABW	95th Air Base Wing
412 TW	412th Test Wing
AB	Assembly Bill
ACM	asbestos-containing material
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFFTCI	Air Force Flight Test Center Instruction
AFI	Air Force Instruction
AFJMAN	Air Force Joint Manual
AFMC	Air Force Materiel Command
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AFRL	Air Force Research Laboratory
AGE	aerospace ground equipment
ARPA	*Archaeological Resources Protection Act of 1979*
AVAQMD	Antelope Valley Air Quality Management District
BASH	bird/wildlife aircraft strike hazard
BEE	Bioenvironmental Engineering
BMP	best management practice
CAA	*Clean Air Act of 1970*
CAAA	*Clean Air Act Amendments*
CARB	California Air Resources Board
CCR	California Code of Regulations
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CESA	*California Endangered Species Act*
CFR	Code of Federal Regulations
CWA	*Clean Water Act*
DOD	Department of Defense
DODI	Department of Defense Instruction

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

EA	Environmental Assessment
EAFBI	Edwards Air Force Base Instruction
EIAP	Environmental Impact Analysis Process
EO	Executive Order
ERP	Environmental Restoration Program
ESA	*Endangered Species Act of 1973*
FAA	Federal Aviation Administration
FFA	Federal Facility Agreement
FOD	foreign object damage
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
H&SC	Health and Safety Code
HAP	hazardous air pollutants
HAZCOM	hazardous communications
HAZMAT	hazardous material
HWMP	Hazardous Waste Management Plan
IAW	in accordance with
IFAST	Integrated Facility for Avionics Systems Testing
IMT	information management tool
KCAPCD	Kern County Air Pollution Control District
MBTA	*Migratory Bird Treaty Act of 1918*
MDAQMD	Mojave Desert Air Quality Management District
MIL-HDBK	Military Handbook
MSWMP	Municipal Solid Waste Management Plan
N/A	not applicable
NAAQS	National Ambient Air Quality Standard
NASA/DFRC	National Aeronautics Space Administration/Dryden Flight Research Center
NEPA	*National Environmental Policy Act of 1969*
NFPA	National Fire Protection Association
NHPA	*National Historic Preservation Act of 1966*
NO_x	nitrogen oxides

LIST OF ABBREVIATIONS AND ACRONYMS (Concluded)

NRHP	National Register of Historic Places
NSR	new source review
O_3	ozone
OSHA	Occupational Safety and Health Administration or Act
PCB	polychlorinated biphenyl
PL	Public Law
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns
PM_{10}	particulate matter less than or equal to 10 microns
RCRA	*Resource Conservation and Recovery Act of 1976*
RFR	radio frequency radiation
SIP	State Implementation Plan
SMU	stormwater management units
SO_x	sulfur oxides
SPCC	Spill Prevention Control and Countermeasures
STD	Standard
SWDA	stormwater drainage areas
SWPPP	Stormwater Pollution Prevention Plan
TSCA	*Toxic Substances Control Act of 1976*
TSE	tactical support equipment
UAS	unmanned aircraft system
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USAF	United States Air Force
U.S.C.	United States Code
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Services
VOC	volatile organic compound
WWTP	wastewater treatment plant

This page intentionally left blank.

1.0 INTRODUCTION

1.1 Purpose and Need for Action

The Air Force Flight Test Center (AFFTC) proposes to increase routine flightline activities to accommodate evolving research and developmental test and evaluation missions on Edwards Air Force Base (AFB). This environmental assessment (EA) evaluates the potential effects of increasing routine flightline activities and updates and/or supplements activities covered in the *Programmatic Environmental Assessment for Routine Flightline Activities, Edwards Air Force Base, California (*Programmatic EA) (AFFTC, 1997a) prepared in March 1997.

Since the preparation of the 1997 Programmatic EA, the AFFTC has continued to support research and developmental test and evaluation of manned and unmanned aircraft systems on base. These missions are expected to increase in variety and complexity from current levels and into the future. Additionally, changes and modifications in maintenance function and flightline activity would be anticipated.

To ensure increased flightline activities remain in compliance with environmental regulations, a review and evaluation of these activities is required. Routine flightline activities covered by this EA would be limited to areas of the base where significant impacts to the environment would not be expected. Routine flightline activities would be analyzed on a case-by-case basis through the *National Environmental Policy Act of 1969* (*NEPA*) (42 United States Code [U.S.C.] Section 4321 et seq.) screening process. The screening process would indicate required minimization measures that must be implemented to minimize negative impacts to the environment.

This EA is being prepared in accordance with (IAW) the requirements of the *NEPA*, as amended; Council on Environmental Quality regulations for implementing the procedural provisions of *NEPA* (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508); Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, which completely adopts 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*; and all other applicable federal and local regulations.

1.2 Location and Scope of the Proposed Action

Edwards AFB is located in the Antelope Valley region of the western Mojave Desert in Southern California. It is about 60 miles northeast of Los Angeles, California. The base occupies an area of approximately 301,000 acres or 470 square miles (Figure 1). For the purpose of this EA, the flightline is defined as the area where aircraft are routinely parked, serviced, taxied, and towed. The flightlines at Edwards AFB are located in Main Base, North Base, and South Base areas; Rogers and Rosamond Dry Lakes; and aircraft operating areas in remote locations. The majority of the associated shops, facilities, and hangars are located immediately adjacent to the flightline areas for easy access to aircraft and to allow movement of aircraft and aircraft components between facilities and the flightline. Consequently, they are included in this EA's definition of flightline. Tables showing the descriptions and figures showing locations of the flightline facilities can be found in Appendix A.

The analyses in this EA are limited to ground operations and do not address any in-flight activity. Additionally, the impacts of related construction activities are not analyzed in this EA.

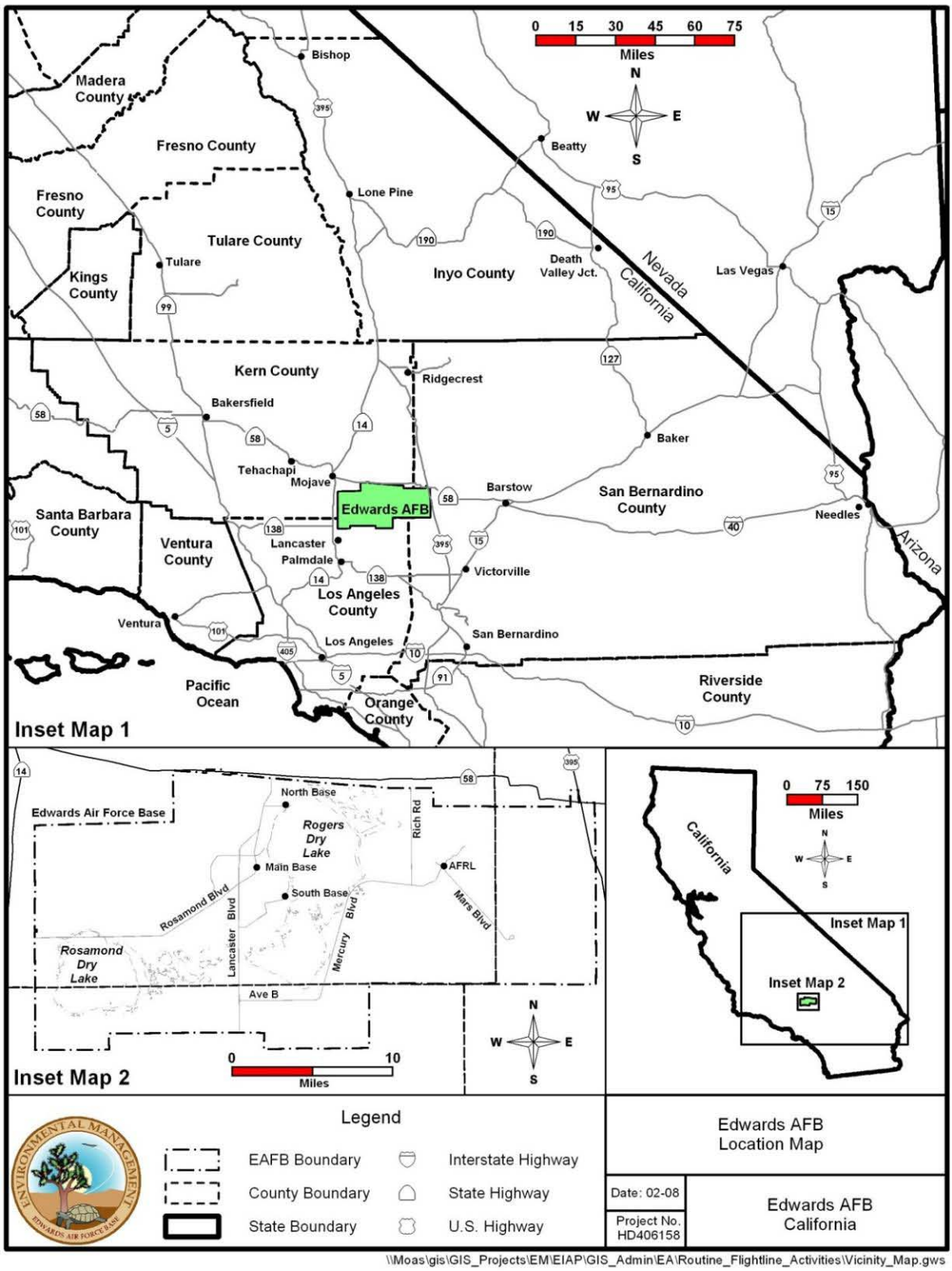


Figure 1. Location of Edwards AFB

1.2.1 Flightline Areas

1.2.1.1 Main Base

This flightline is located between the National Aeronautics Space Administration/Dryden Flight Research Center (NASA/DFRC) to the north and Benefield Anechoic Facility to the southwest. The NASA/DFRC is connected to the main flightline by a single taxiway. The Main Base flightline is bounded on the west and north by Wolfe and Lilly Avenues, respectively, and Rogers Dry Lake on the east (Figures 2 and 3). The main flightline is comprised of ramp areas, taxiways, a control tower, maintenance hangars, and various support and administrative buildings. Three taxiways connect the flightline to the hard-surface runway. The runway is 14,994 feet long and 300 feet wide and it is classified as Class B for high performance, large and heavy aircraft use (95th Air Base Wing [95 ABW], 2009c).

1.2.1.2 North Base

This flightline is located at the northern end of Rogers Dry Lake and is bounded by North Base Road on the northwest side and the dry lakebed on the southeast side (Figure 4). The flightline is composed of a ramp area with hangar facilities, support and administrative buildings, and control tower. A single taxiway connects the flightline to the hard-surface runway located to the north. According to AFFTC Instruction (AFFTCI) 11-1, *Air Operations*, the North Base runway is 5,998 feet long and 150 feet wide. It is classified as a Class A runway, used for small and light aircraft weighing 12,500 pounds or less for normal operations (95 ABW, 2009c).

1.2.1.3 South Base

This flightline is bounded by C Street to the north and Jones Road to the south (Figures 5 and 6). The flightline is composed of hangars, ramp areas, taxiways, administrative buildings, and various support and test facilities. The ramp area is used for both aircraft operations and as a parking area for personal vehicles. The ramp is connected to the paved runway south of the facilities by seven taxiways. The runway is 8,000 feet long and 300 feet wide; and classified as Class A for small and light aircraft use. The flightline is also connected to the Main Base runway to the northwest with access along a single runway (95 ABW, 2009c).

1.2.1.4 Lakebed Runways

The unpaved runways on Rogers and Rosamond Dry Lakes (Figure 7) are delineated with paint and aeronautical field markers. The runways and landing areas are used for: emergency response landing; alternate landing sites; aircraft engine testing; and aircraft systems and avionics testing, evaluation, and development. Lakebed runway areas are available for use when dry, free of potholes, and other unspecified hazards which would prevent a safe landing (AFFTCI 11-1).

1.2.1.5 Other Land Areas

In addition to the previously mentioned areas, "...Edwards AFB identifies undeveloped or unimproved/semi-improved land consisting of maintained and unmaintained landing sites that could be used for routine flightline activities ..." (AFFTC, 2001a). These landing sites could be used for routine flightline activities including the launch and/or recovery of unmanned aircraft systems (UAS) and future flight platforms.

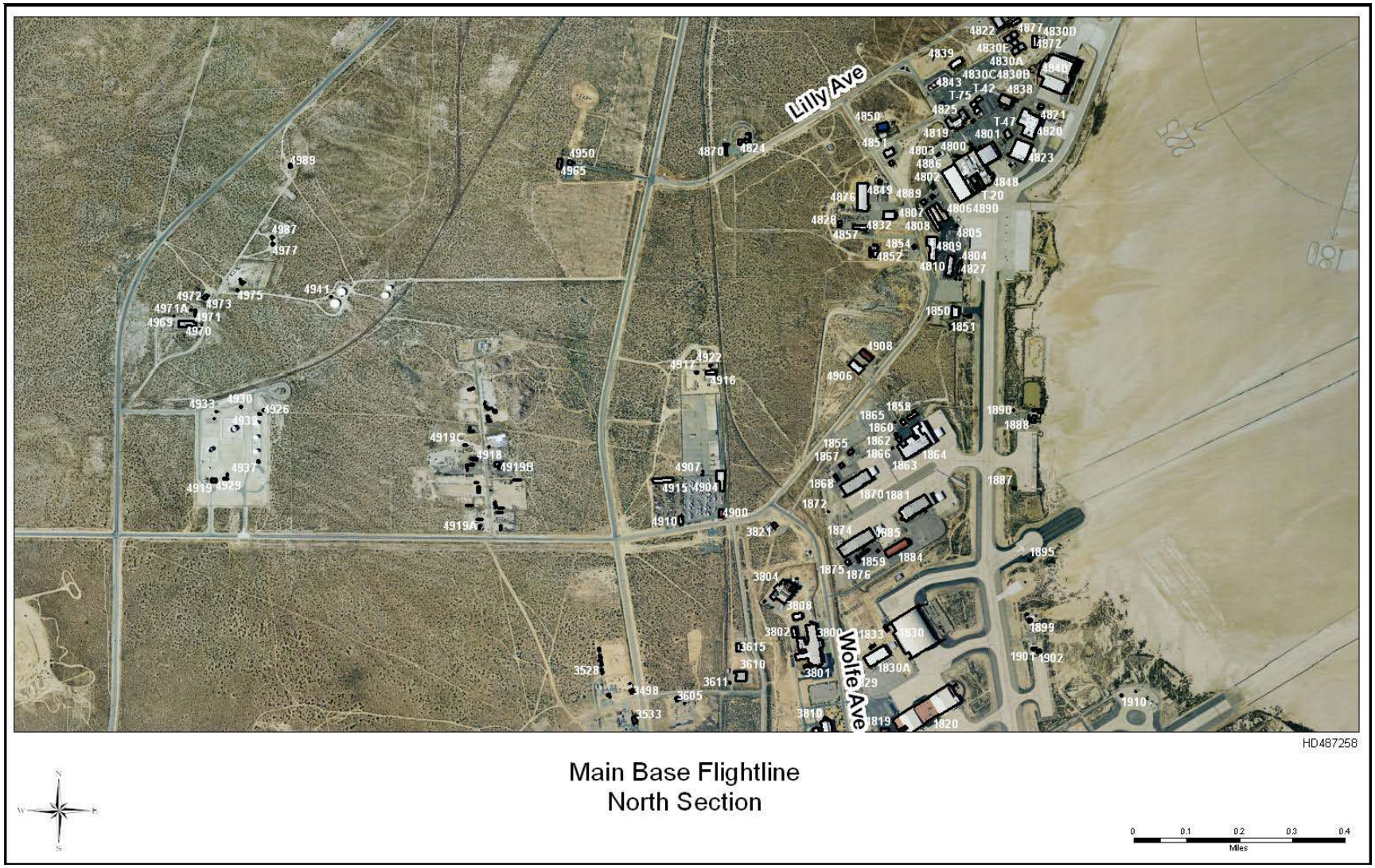


Figure 2. Location of Main Base Flightline Area, North

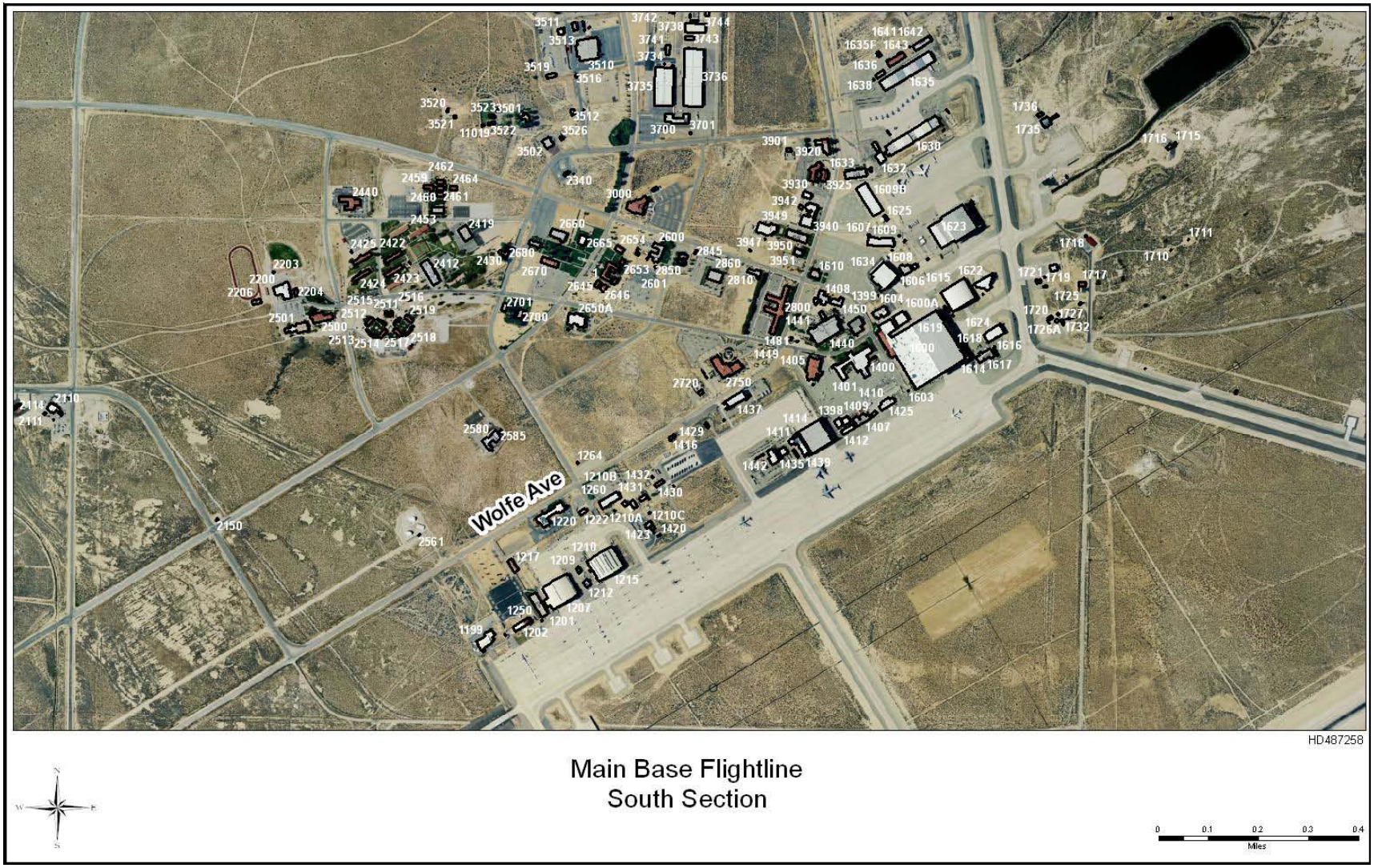


Figure 3. Location of the Main Base Flightline, South

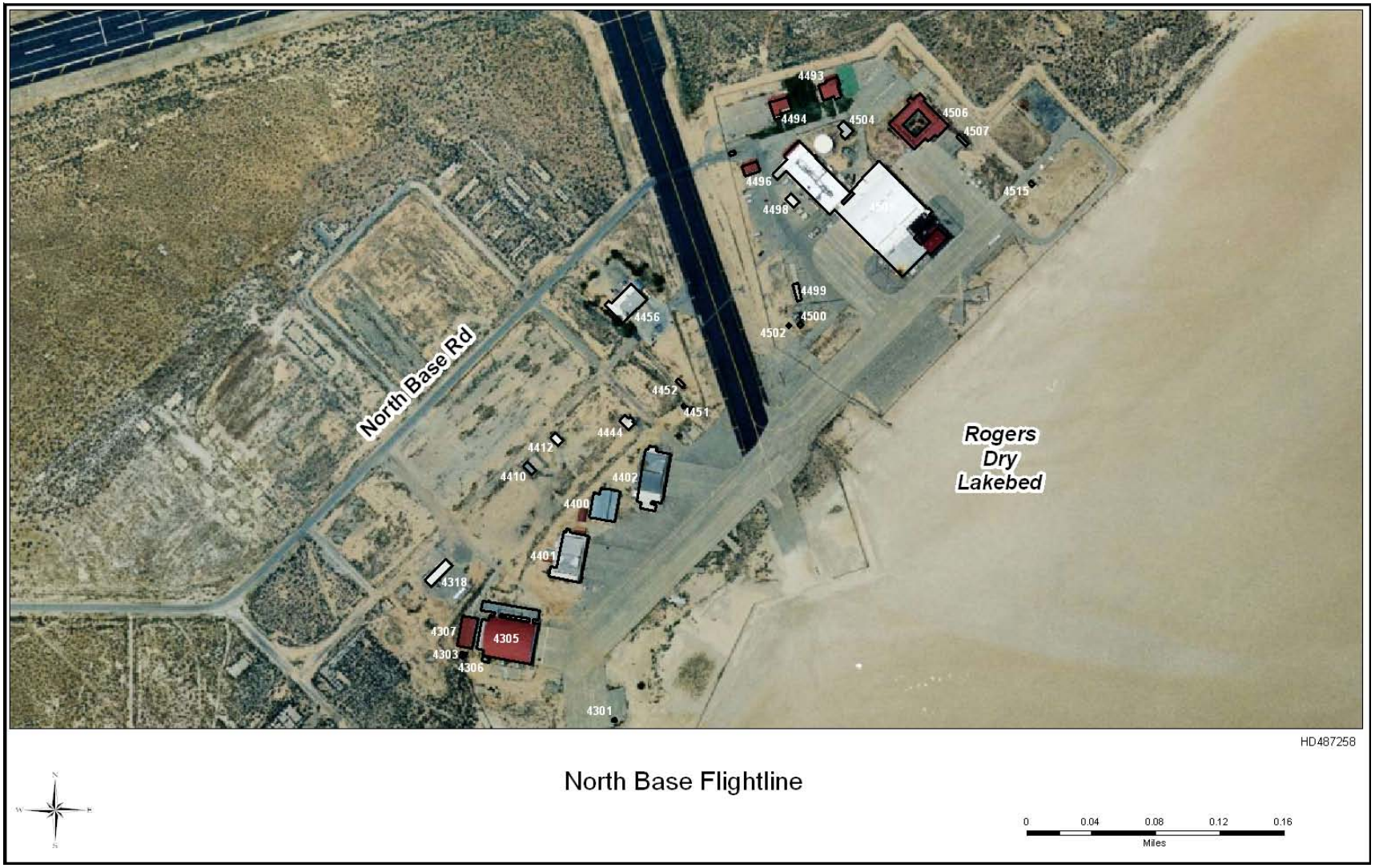


Figure 4. Location of the North Base Flightline

Figure 5. Location of the South Base Flightline, North

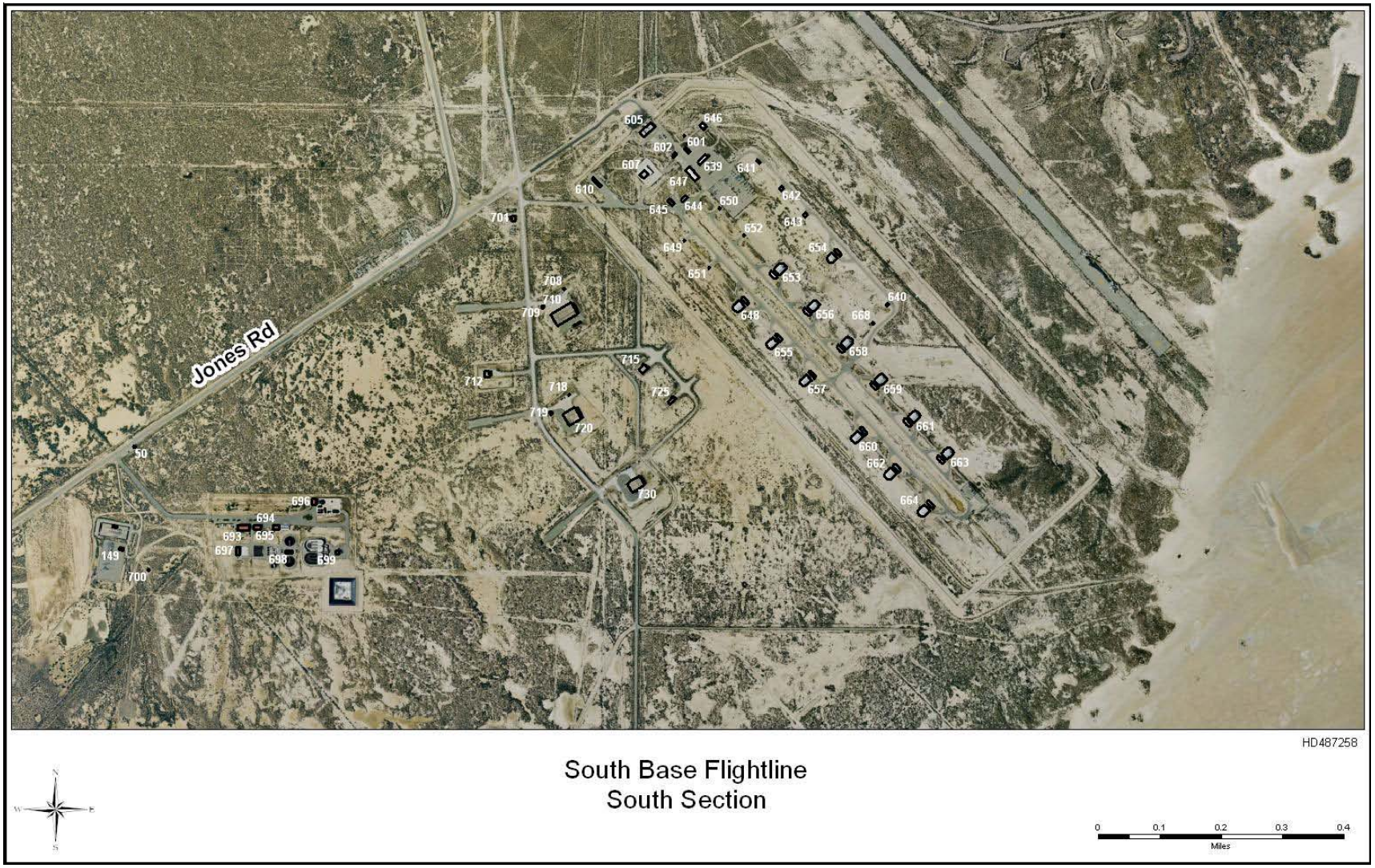


Figure 6. Location of the South Base Flightline, South

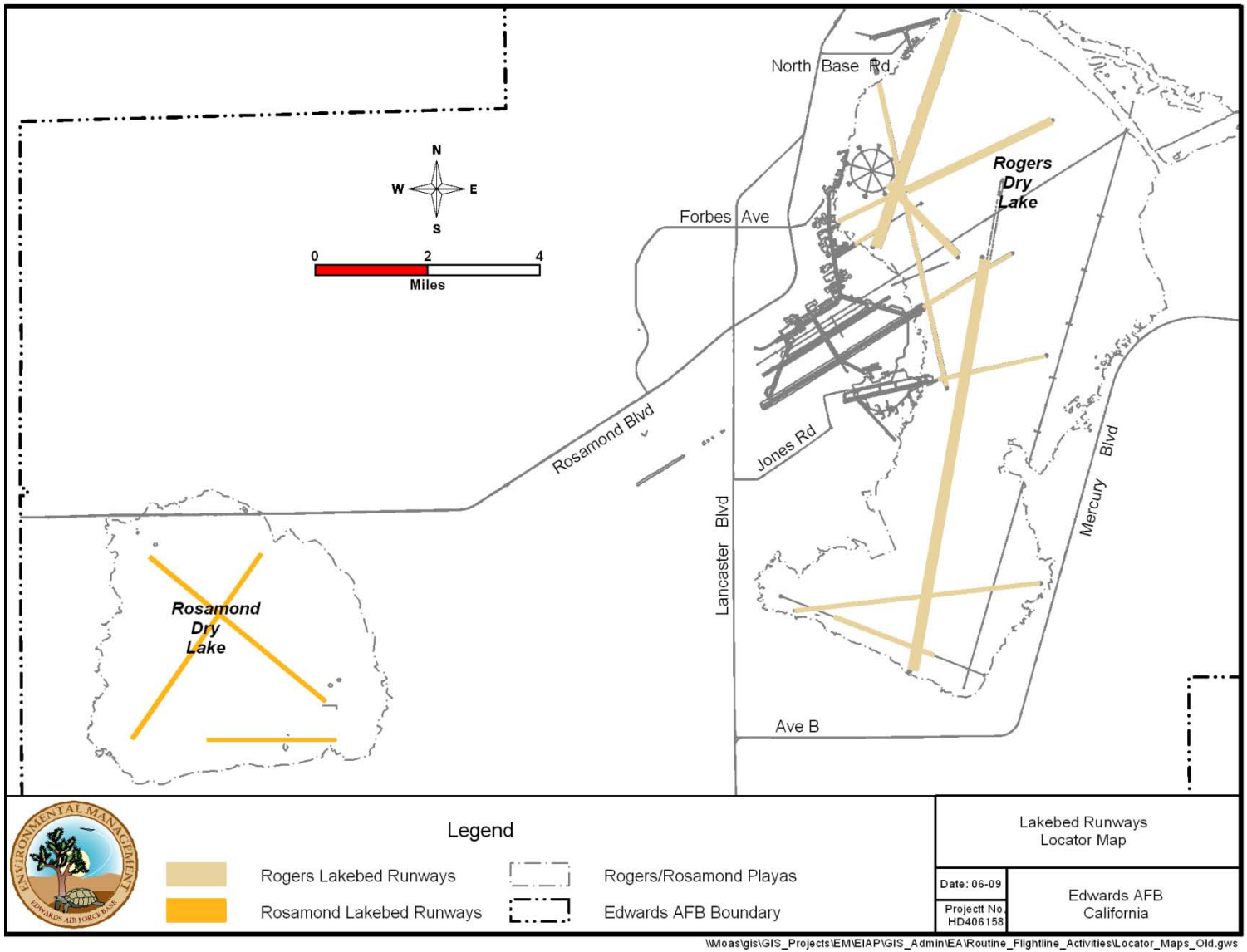


Figure 7. Location of the Dry Lake Runways

1.3 Resource Issues and Concerns

1.3.1 Resource Issues and Concerns Studied in Detail

During the scoping process, the proposed Action and No Action alternatives were evaluated to determine potential environmental impacts. The environmental resources evaluated included the following:

a. Land Use. Routine activities near the flightline areas may create foreign object damage (FOD) material, and cause conditions for bird/wildlife aircraft strike hazards (BASH), which would be of concern to aircraft operations;

b. Air Quality. Air quality would be affected by mobile source emissions from aircraft and aerospace ground equipment (AGE), stationary sources such as paint operations, fueling and defueling operations, and other activities such as soil excavation and grading activities;

c. Water Resources. Chemicals associated with routine flightline activities have the potential to affect water resources. Excavation and surface grading along the flightline could alter natural drainage patterns. Newly exposed areas could contribute sediment debris to surface-water runoff during seasonal rains causing a potential for pollution to enter stormwater drains;

d. Safety and Occupational Health. General maintenance, operations, and support activities could expose field personnel to hazards and safety concerns. Standard safety procedures and practices would be in place to mitigate risks from exposure to hazards such as directed energy, chemical, explosives or ordnance, and noise; as well as environmental hazards such as heat stress, venomous snakes, poisonous insects, valley fever, and hantavirus;

e. Hazardous Materials/Hazardous Waste and Solid Waste. Routine flightline activities could use hazardous materials and generate hazardous or solid waste;

f. Biological Resources. Activities could have potential impacts to desert tortoise (*Gopherus agassizii*), plants, migratory birds, and habitat;

g. Cultural Resources. Cultural resource sites could be disturbed during routine flightline activities. Activities would be limited to previously disturbed areas to the maximum extent possible;

h. Geology and Soils. Fill material could be used to infill areas. Geologic faults are mapped for flightline and drylake areas. The faults have remained dormant for the past 50 years. Environmental Restoration Program (ERP) sites are located in the vicinity of the flightline areas and are in various stages of remediation;

i. Socioeconomics. Increasing routine flightline activities could have a positive yet incremental impact on labor and revenue on Edwards AFB and surrounding communities;

j. Infrastructure. During routine flightline activities, transportation of materials and equipment to and from the flightline areas could impact existing traffic patterns. Trenching activities could encounter existing utility and communication lines; and

k. Energy Conservation. General maintenance and support activities would periodically replace outmoded equipment. New equipment would incorporate technologies designed to improve operations and energy efficiency.

1.3.2 Resource Issues and Concerns Eliminated from Detailed Study

The following resource issues and concerns were initially considered, but subsequently eliminated from further consideration in this EA.

a. Environmental Justice was eliminated from further review during the scoping process. It was determined that conducting general maintenance, operational, and support activities along the flightline areas would not impact any environmental justice concerns. Given routine flightline activities would occur entirely in designated areas of the base and away from populated areas, the Air Force has determined that this action has no substantial, disproportionate impact to minority or low-income populations and children.

Executive Orders (EOs) on environmental justice and the protection of children require federal agencies to identify and address disproportionately high adverse effects of its activities on minority or low-income populations and children. This action has been reviewed IAW EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* and EO 13045, *Protection of Children from Environmental Health and Safety Risks.*

b. Floodplain management was eliminated from further review during the scoping process. The proposed action and alternative were reviewed IAW EO 11988, *Floodplains Management*, and it was determined that flightline activities would not impact floodplain management. Executive Order 11988 requires federal agencies to evaluate the potential effects of actions it may take in a floodplain to avoid adversely impacting floodplains wherever possible; ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management, including the restoration and preservation of such land areas as natural undeveloped floodplains; and prescribe procedures to implement the policies and procedures.

Routine flightline activities as described in this EA would not include building construction or modification of the flood-prone areas on Edwards AFB (French et. al., 2003; French and Miller, 2004).

1.4 Permits, Guidance, and Approvals

The contractor/proponent performing work is responsible for obtaining the relevant permits and accomplishing any required notifications. Environmental permitting requirements for all work on base are coordinated through the 95 ABW Environmental Management Directorate. The permits, guidance, and approvals listed in Appendix B could be required; however, as permitting requirements change, additional permits may be required.

1.5 Related Environmental Documents

A number of environmental documents have been prepared and approved that address activities discussed in this EA. These documents, listed in Appendix C, contain information used in the preparation of this EA.

1.6 Future Use of this Document

Future projects proposed for the flightline areas at Edwards AFB would be documented on an Air Force (AF) Form 813, *Request for Environmental Impact Analysis*, and reviewed and

evaluated to determine if the project falls within the scope of this EA. If the proposed project falls within the scope of this EA, and no new environmental impacts would result, a categorical exclusion would be prepared. In some cases, a supplement to this EA may be required. In that case, a new Finding of No Significant Impact (FONSI) would be required. For those projects that result in significant impacts to the environment, such that the impacts cannot be mitigated to a level of insignificance, a separate *NEPA* analysis (EA or Environmental Impact Statement) may be required.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section introduces the alternatives that were evaluated for potential environmental impacts. The proposed alternatives that are analyzed in this document are: Alternative A– Increasing Routine Flightline Activities (Proposed Action alternative) and Alternative B– Continue Routine Flightline Activities at Present Levels (No Action alternative).

2.1 Alternative A–Increasing Routine Flightline Activities (Proposed Action Alternative)

Under this alternative routine flightline activities would increase to support current and future AFFTC missions. Routine flightline activities described in the Programmatic EA (AFFTC, 1997a) would be updated to reflect approximately a 10-percent increase in research and developmental test and evaluation missions arriving on Edward AFB. Routine flightline activities include, but are not limited to, the following:

a. Maintenance Activities

(1) Scheduled Maintenance. Traditional, core maintenance programs (90 percent of maintenance operations) based on factors including: calendar days, flight hours accumulated by the aircraft, or specific operating cycles for a particular component;

(2) Unscheduled (as-needed) Modification-Based Maintenance. Conducted during developmental test and evaluation of new or modified aircraft and aircraft subsystems to measure and evaluate the performance or modify the design to change or improve performance of aircraft and/or testing missions. Additionally, unscheduled maintenance, repair, or replacement of a component is required when a component no longer operates correctly;

(3) Back Shop Maintenance. Back shops are collective workshop areas or facilities where aircraft components are repaired and specialized operations are conducted. This includes specialized repair of the following systems and activities:

(a) Component Repair. Avionics (communication/navigation/radar), pneudraulics (hydraulic and pneumatic [high pressure] systems), and control systems;

(b) Aircraft/UAS Repair. Machine-tool parts, corrosion control, tires, egress systems-ejection seats, cockpit canopy ejection devices, wash racks, and paint booth;

(c) Fabrication and Modification. Aircraft component parts (e.g., sheet metal, welding, plastics, composites, exotic materials, or instrumentation);

(d) Propulsion Shop. Jet engine repair, propeller-driven engine repair, engine parts cleaning;

(e) Ground Support. Tactical support equipment (TSE), hydraulic mules, and airfield equipment; and

(4) Depot Maintenance. Conduct heavy maintenance and repair on aircraft parts (i.e., jet engines) and establish facilities to strip down aircraft; establish centralized intermediate repair facilities, providing a central location for component repairs such as aircraft engines, electronic warfare pods, avionics line replaceable units, wheel and tire assemblies, and other aircraft components.

b. Operational Activities

(1) Mixed-Group Operations. Provide support facilities for Air Force contractor services, Department of Defense (DOD) organizations, off-base Air Force organizations, foreign governments, public institutions, and private companies to conduct research and developmental test and evaluation of aircraft flight test missions;

(2) Management. Supervise and perform airfield management functions and activities including, but not limited to:

(a) Flight test programs for manned and unmanned aerial systems;

(b) Unmanned aerial systems programs could include additional personnel, hangar space, AGE, and changes to the logistics infrastructure that could include the addition of storage tanks, storage facilities, and munitions holding areas;

(c) Coordination of aircrews and providing various base agencies with safe operation of aircraft on the airfield and in controlled airspace;

(d) Air Traffic Control operations;

(e) Bed-down operations;

(f) Operation of the Test Pilot School;

(g) Operation of the runways for nonmilitary specific use, such as, but not limited to, the Aero Club, filming, quality of life, and morale and welfare activities; and

(h) Meteorological services.

c. Logistics Activities

(1) Developmental Test and Evaluation Function. Test and evaluate aircraft and UAS components, examine maintenance plans and designs to minimize duplication, examine ways to expedite maintenance procedures and safely operate aircraft and UAS on the airfield;

(2) Materiel Function. Maintain Air Force systems readiness by conducting research, developmental test and evaluation programs, and providing acquisition management and logistics support services;

(3) Ground Transportation Services. Vehicular support, loader and forklift support for aircraft, and transfer of munitions between flightline areas and munitions storage areas.

d. Support Activities

(1) Fuels Management. Provide storage and distribution facilities for fuel and propellant, and provide quality and control inspections;

(2) Hazardous Material (HAZMAT) Pharmacy. Maintain receiving and distribution centers for HAZMAT;

(3) Utilities. Provide utility services (e.g., communications, electrical, fuel, or waste management);

(4) Munitions. Provide storage, facilities for ordnance training, and loading and off-loading munitions;

(5) Security. Provide controlled access to the flightlines and restricted areas, repair fences, and install access barriers;

(6) Fire Protection Services; and

(7) Surface Maintenance. Maintain taxiways, aprons, pads, roadways, shoulders, and lakebeds. Further analysis of surface and road repair activities can be found in the *Programmatic Environmental Assessment for Road Repair Projects, Edwards Air Force Base, California* (AFFTC, 1994c).

(a) Grade and repair surfaces (i.e., surface fissures, spalls, cracks, and seep holes);

(b) Paint runway and taxiway markings and striping;

(c) Foreign object damage control; and

(d) Weed abatement.

2.2 Alternative B–Continue Routine Flightline Activities at Present Levels (No Action Alternative)

Under the No Action alternative, routine flightline activities would be conducted at present levels, as described in the 1997 Programmatic EA (AFFTC, 1997a). The No Action alternative provides the environmental baseline information (the 'as is' condition) from which all future alternative actions, including Alternative A, are compared.

2.3 Criteria for Selection of a Reasonable Range of Alternatives

The criteria identified in this section establish a minimum set of requirements that must be met in order for an alternative to be considered viable. The alternatives not meeting one or more of the selection criteria have been eliminated from further discussion. Alternatives meeting all selection criteria are retained, and each is fully analyzed in Section 4.0, Environmental Consequences, of this EA.

The following criteria were used to select the alternatives in this document.

a. Technical/Operational

(1) Fulfill flightline user requirements;

(2) Support the mission of the AFFTC and its tenant organizations; and

(3) Comply with the following documents:

(a) AFFTCI 10-2, *Control of Vehicles on the Airfield* (2005);

(b) AFFTCI 21-5, *Foreign Object Damage (FOD) Prevention Program* (2004);

(c) *Edwards Air Force Base Energy Plan* (AFFTC, 1995b);

(d) Edwards Air Force Base Instruction (EAFBI) 23-2, *Entry, Exit, and Control of Petroleum Transport Vehicles* (2005);

(e) Military Handbook (MIL-HDBK) 1022A, *Petroleum Fuel Facilities* (1999);

(f) MIL-HDBK 1008C, *Fire Protection for Facilities Engineering, Design, and Construction* (1997);

(g) Unified Facilities Criteria (UFC) 3-260-01, *DOD Airfield and Heliport Planning and Design* (2006);

(h) UFC 3-460-03, *Operation and Maintenance: Maintenance of Petroleum Systems* (2003); and

(i) UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings* (2003).

b. Environmental

(1) Minimize habitat disturbance to level of insignificance;

(2) Retain optimum amount of undisturbed areas;

(3) Ensure compliance with environmental regulatory requirements and guidance;

(4) Comply with pollution prevention goals;

(5) Reduce greenhouse gas (GHG) emissions; and

(6) Reduce personnel exposure to workplace hazards.

c. Economic

(1) Achieve cost effectiveness of flightline operations;

(2) Enhance the capability of flightline operations; and

(3) Improve maintenance procedures to reduce turnaround times.

2.4 Alternatives Considered But Dismissed from Further Consideration

All alternatives considered were viable and have been retained for analysis throughout this EA.

2.5 Comparison Summary of Alternatives

Table 1 provides a comparison of the Proposed Action and the No Action alternative, and Table 2 presents a summary comparison of the potential impacts of the alternatives.

3.0 AFFECTED ENVIRONMENT

This section describes the relevant environmental resources at Edwards AFB that would be, or would potentially be, affected by additional routine flightline activities. This section establishes a baseline against which the decision makers and the public can compare the effects of all action alternatives. The following environmental attributes are affected: Land Use, Air Quality, Water Resources, Safety and Occupational Health, Hazardous Materials/Waste and Solid Waste, Biological Resources, Cultural Resources, Geology and Soils, Socioeconomics, Infrastructure, and Energy Conservation and Consumption. Regulatory requirements and guidance documents for the affected environmental resources are available in Appendix D.

Table 1. Comparison of Alternatives

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Project Description	Increase activities and evaluate additions and expansions to flightline capabilities to include new developmental test and evaluation missions of aircraft and unmanned aerial system platforms.	Continue current routine activities occurring on the flightline.
Location	Activities would occur along the flightlines at Main Base, North Base, and South Base; dry lakebeds; and other Air Force Flight Test Center designated areas (e.g., remote locations) depending on specific test requirements. Flightline activities would also occur on adjacent properties.	Activities would occur mainly within the flightline areas of Main Base, North Base, and South Base; dry lakebeds and other designated landing sites, for example, remote sites.
Project Implementation	Additional routine flightline activities would be conducted for developmental test and evaluation, and research and developmental flight test missions. Operation and maintenance projects are estimated between $5 million and $30 million. Costs would vary with mission requirements and location on the flightline and in adjacent properties.	Current level of routine flightline activities would continue to be conducted for developmental test and evaluation, and research and developmental flight test missions. Operations and maintenance projects would occur as needed and remain within current boundaries of the flightlines.

Table 2. Summary of the Potential Environmental Impacts[1]

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action Alternative)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Land Use		
Land use compatibility with the *General Plan, Edwards Air Force Base, California* (Base General Plan) (95th Air Base Wing, 2009c) and all Air Force Instructions (AFI) and regulations	Additional routine flightline activities would be in areas compatible with the Base General Plan and all AFIs and regulations.	Land use would not change from existing conditions.
Potential introduction/generation of foreign object damage (FOD) materials	The potential for FOD material generation exists from additional routine flightline activities. Best management practices and guidelines are in place and are followed to reduce significance of this concern.	The potential for FOD material generation would be less than Alternative A.
Bird/wildlife aircraft strike hazards (BASH)	The potential for BASH would increase during bird migratory seasons which occur in spring and fall. However, measures are already in place for minimization.	The potential for BASH impact would be similar to those discussed under Alternative A.
Air Quality		
Degradation in air quality	Emissions would be generated from additional routine flightline activities. Toxic air contaminants would also be generated during flightline activities. Release of greenhouse gas (GHG) emissions is possible from fueling/defueling stations, exhaust from vehicles and internal combustion engines.	Fugitive emissions generated would be less than Alternative A, since activities would not increase and would be conducted intermittently or as needed. Release of possible GHGs would be less than Alternative A, since activities would be intermittent.

Table 2. Summary of the Potential Environmental Impacts (Continued)

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action Alternative)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Water Resources		
Quality of Stormwater	Runoff from excavation sites during rain showers could affect local drainage causing excess sediment to enter the stormwater drainage system. Also, hazardous materials storage and usage sites have the potential to introduce chemicals and free product into the stormwater system, affecting water quality.	Excavation projects would be similar to Alternative A, but conducted incrementally on an as-needed basis. Sediment runoff and hazardous material handling would be less than discussed under Alternative A, decreasing the potential for introduction to the stormwater system.
Generation of wastewater	Project activities would generate wastewater.	Project activities would generate wastewater consistent with the quantities currently generated, but less than quantities expected under Alternative A.
Safety and Occupational Health		
Potential exposure to hazardous noise levels	Personnel working on the flightlines and in shop areas may be exposed to increased noise levels generated by flightline and shop operations; and use of heavy equipment.	Personnel would be exposed to noise levels similar to levels discussed under Alternative A.
Directed Energy	Personnel could be exposed to high frequencies of directed energy at risk levels during research and developmental testing and in the field during air-to-ground, ground-to-ground, or ground-to-air testing.	Personnel could be exposed to levels of directed energy similar to Alternative A. Since projects would be conducted intermittently and on an as-needed basis, the opportunities for exposure would be less.

Table 2. Summary of the Potential Environmental Impacts (Continued)

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action Alternative)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Safety and Occupational Health (Concluded)		
Munitions Handling	Flightline personnel could be at risk during the handling of munitions.	Personnel handling munitions on the flightline would be similar to Alternative A. Since flight testing would be conducted intermittently, the opportunities to handle munitions would be less than discussed under Alternative A.
Inhalation exposure to paint particulates	Personnel may be exposed to paint particulates during additional routine flightline activities.	Personnel could be exposed to paint particulates similar to Alternative A. Since projects would be conducted intermittently as needed, opportunities for exposure would be less.
Inhalation exposure to asbestos-containing material (ACM) particulates	Personnel may be exposed to ACM particulates during renovation or maintenance activities.	Personnel exposure to ACM particulates would be similar to Alternative A. The opportunities for exposure would be less due to the intermittent nature of expected projects.
Environmental hazards	Personnel may be exposed to heat stress, venomous snakes, and valley fever.	Personnel may be exposed to heat stress, venomous snakes, and valley fever. Since projects would be conducted intermittently as needed, opportunities for exposure would be less.
Hazardous Materials/Waste and Solid Waste		
Distribution of jet fuels to flightline	Flammable fuels are distributed in pipelines to flightline areas.	Distribution of jet fuels would be similar to Alternative A.
Hazardous waste	Flightline activities would generate hazardous products.	Generation of hazardous waste would be similar to Alternative A, but quantities would be less, since actions would be conducted as needed.

Table 2. Summary of the Potential Environmental Impacts (Continued)

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action Alternative)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Hazardous Materials/Waste and Solid Waste (Concluded)		
Solid waste	Flightline activities would generate solid waste products.	Generation of solid waste would be similar to Alternative A, but amounts would be less, since actions would be conducted as needed.
Biological Resources		
Effects to biological/natural resources	Activities along the flightline and in adjacent areas may disturb biological resources.	Biological resources disturbance would be similar to Alternative A, but impacts would be less since actions would be less than those in Alternative A.
Cultural Resources		
Effects to cultural resources	Cultural resource sites may be disturbed during general maintenance and operational activities.	Cultural resource sites would not be disturbed since activities would be confined to the flightline and previously disturbed areas.
Geology and Soils		
Material Use	Projects could require the use of fill material from borrow sites. The use of new borrow sites would be cleared of biological resources prior to use.	The use of fill material would be anticipated to be similar to Alternative A.
Soil disturbance/erosion	Site maintenance and grading activities would disturb soil surfaces. Short-term erosion may occur when soils become exposed to high winds, heavy rains, or vehicular and equipment use.	Site maintenance and grading activities would disturb soil surfaces. Short-term erosion may occur when soils become exposed to high winds, heavy rains, or vehicular and equipment use.
Seismic Activity	The Mirage Valley Fault is mapped through Main Base and South Base. The fault is seismically dormant with no record of historic earthquake activity along its trace.	The seismic setting is the same as those found in Alternative A.

Table 2. Summary of the Potential Environmental Impacts (Concluded)

Environmental Issue	Alternative A Increasing Routine Flightline Activities (Proposed Action Alternative)	Alternative B Continue Routine Flightline Activities at Present Levels (No Action Alternative)
Geology and Soils (Concluded)		
Environmental Restoration Program (ERP) equipment disturbance	Additional routine flightline activities have the potential to disturb equipment and lines installed at ERP sites.	Equipment and lines installed at ERP sites could be disturbed periodically as projects would be conducted as needed.
Socioeconomics		
Generation of revenue into the local economy	Incremental benefits would be realized from funds spent in nearby communities. Personnel and workforce supporting increased missions on the flightline would be cyclical, providing positive yet temporary impacts on the local economy while the project is in progress.	Incremental benefits would depend upon the total number of projects conducted as needed.
Infrastructure		
Use of transportation system	Some flightline activities would require the transportation of equipment/material along major roads, rail, or by haul trucks. Minor short-term congestion is expected when large, slow-moving vehicles travel on access roads to flightline areas.	Incremental activities along the flightline would be conducted as needed affecting the use of the transportation system.
Utilities and communications system	Activities along the flightline and in adjacent properties would encounter buried utility and communication lines.	Activities along the flightline would encounter buried utility and communication lines similar to Alternative A.
Energy Conservation		
Installation of energy efficient systems	Replacement equipment and installation of new equipment would improve operational and energy efficiencies.	Replacement equipment would be similar to Alternative A. Less new equipment and/or upgrades would be accomplished if routine flightline activities continue at present levels.

[1]Because minimization measures are already in place for routine activities, no significant adverse impacts are anticipated from either alternative.

3.1 Land Use

Land may be used for a variety of activities including commercial, recreational, industrial, and military. Specialized land uses may include radio transmission areas, explosive ordnance ranges, and airfields. The Base General Plan (95 ABW, 2009c) lays out the long-range development at Edwards AFB. This plan establishes the goals, policies, plans, and anticipated actions regarding the physical, social, and economic environment.

3.1.1 Land Use Restrictions

Air Force land use policies and guidance are only applicable to lands under Air Force control. Policies established for airfields are similar to the criteria established by the Federal Aviation Administration (FAA) for development surrounding civilian airports. Air Force Joint Manual (AFJMAN) 32-1031(I), *Airfield and Heliport Planning and Design* (1 May 1997), sets the minimum requirements for airfields and applicable land uses for the areas surrounding the airfield. The Edwards AFB Planning and Zoning Committee grants final siting approval for all construction related projects. Installations are also required to ensure that all structures and facilities conform to the airfield and airspace clearance criteria defined in UFC 3-260-01, *DOD Airfield and Heliport Planning and Design*. The instruction specifies criteria and standards for planning, developing, and siting airfield facilities, including support facilities. Flightline activities would be required to conform to these standards and criteria.

Routine flightline activities include the handling of explosive material and establishment of quantity-distance zones associated with test areas and areas that store explosives, munitions, and propellants. These areas vary in size depending upon the quantity and types of the explosives being used or stored. These zones ensure the safety of all personnel within a given area. Typical areas where these zones exist include the unconventional fuels, explosive ordnance disposal, gun-butt, the munitions storage, arm/disarm, and hot cargo areas.

The Base General Plan (95 ABW, 2009c) provides information regarding established land use designations for the base. The land use designations, and total acreage are found in Table 3.

3.1.2 Airfield Operations

Flightline operations are carried out by the 412th Test Wing (412 TW) and 95 ABW. The 412 TW is the direct mission organization of the AFFTC that is responsible for test/integration and evaluation of manned and unmanned aerial systems, subsystems, and components. The 95 ABW is the support unit on Edwards AFB that is responsible for communications; civil engineering; transportation, including loading and unloading armament and supplies; fuel supply; security police; and fire protection.

The 412th Operations Group plans and conducts all flight test activities for the 412 TW. The 412th Operations Group also advises the 412 TW on air traffic control matters, and airfield and airspace management, including flight management.

Use of the Edwards AFB airfield is limited to authorized personnel only, such as the Air Force, other government organizations, and contractors. Airfields are used to develop, test, and fly aircraft. Authorized government and private vehicles operate on the roads, taxiways, and runways. Pedestrian traffic occurs on the airfield with the heaviest concentration being in and around the hangars. The period of greatest use on the airfield occurs during weekdays.

Table 3. Edwards Air Force Base Land Use Designations

Real Property Inventory Requirements Class	Current Land Use	
	Acres	Square Miles
Airfield	8,574.0	13.397
Communication System	164.9	0.258
Forest and Wildlife	202.6	0.317
Housing	1,060.3	1.657
Institutional	393.1	0.614
Misc. Military Land	13,209.3	20.640
Navigation and Traffic Aids	36.1	0.056
Office Building Location	67.4	0.105
Other	13,341.5	20.846
Parks and Historic Sites	18,131.7	28.331
Post Office	0.5	0.001
Research and Development	248,298.4	387.966
Storage	528.3	0.825
Training Land	4,211.3	6.580
Vacant	66.5	0.104

Source: *General Plan, Edwards Air Force Base* (95 ABW, 2009c)

3.1.3 **Foreign Object Damage Control**

Routine flightline activities have the potential to generate FOD materials. Materials or debris, such as nuts, bolts, screws, wood, trash, or pieces of concrete or asphalt, may end up on runways, taxiways, or aprons as a result of routine flightline activities. The presence of FOD materials near runways and taxiways is a concern since the materials could be ingested by aircraft. The FOD materials, when airborne, may also pose a physical threat to personnel in the area. The prevention of FOD is targeted specifically at flightline areas and procedures are contained in Air Force Materiel Command (AFMC) Supplement 1 to AFI 21-101, *Aircraft and Equipment Maintenance Management* (2006). The Logistics Quality Assurance Inspection Branch is responsible for the reduction and/or elimination of FOD.

3.1.4 **Bird/Wildlife Aircraft Strike Hazard**

The locations of some flightline areas create a potential for bird/aircraft collisions. Bird/wildlife aircraft strike hazard, considered a safety hazard by AFFTC, is complicated by the installation's location within the Pacific Flyway and the presence of the dry lakebeds that fill up with water after it rains. The overflow/evaporation ponds at the Wastewater Treatment Plant (WWTP) and stormwater ponds in the vicinity of several of the runways also attract waterfowl. Additionally, scrub plant communities surrounding the main runway attract certain species of birds that stand on the ground between bushes and feed on the insects on the shoulders of the runway. The AFFTC supplement to AFI 91-202, *The U.S. Air Force Mishap Prevention Program*, and Air Force Pamphlet 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques* (2004), outlines actions designed to reduce BASH through bird avoidance and control (including harassment, ground maintenance, habitat modification, and depredation) to allow for safe operational mission accomplishment.

3.2 Air Quality

Air quality at Edwards AFB is regulated by the United States Environmental Protection Agency (U.S. EPA), California Air Resources Board (CARB), and locally by air pollution control districts or air quality management districts.

3.2.1 Environmental Setting

The air quality management and air pollution control districts' boundaries are based on meteorological and geographic conditions and, where possible, jurisdictional boundaries such as county lines. Edwards AFB is located within the jurisdiction of three air districts: Kern County Air Pollution Control District (KCAPCD), Mojave Desert Air Quality Management District (MDAQMD), and Antelope Valley Air Quality Management District (AVAQMD) (Figure 8). The MDAQMD has jurisdiction in San Bernardino County, east of the base; and AVAQMD in Los Angeles County south of the base. A large majority of the base is located in the KCAPCD.

Due to the locations of flightline areas, project activities would occur primarily in the eastern Kern County portion of Edwards AFB, under the jurisdiction of the KCAPCD. As a result, maintaining air quality would be conducted IAW the regulatory requirements of the KCAPCD. Similarly, routine flightline activities conducted outside of the KCAPCD's jurisdictional area, such as in the AVAQMD or the MDAQMD, would be expected to comply with regulatory requirements of the respective air districts. Supplemental air quality information is provided in Appendix D.

3.2.2 Baseline Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size of the air basin, and prevailing meteorological conditions. The significance of pollutant concentrations is determined by comparing ambient measured concentration levels to the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards. These standards represent the maximum allowable atmospheric concentrations that may occur, while ensuring protection to public respiratory health and welfare under reasonable margins of safety.

Under the NAAQS, the U.S. EPA has developed numerical air emission concentration standards for seven criteria pollutants under provisions of the 1970 federal *Clean Air Act of 1970* (*CAA*) (42 U.S.C. 7401–7671) and the 1990 *Clean Air Act Amendments* (Public Law [PL] 101-549). The criteria pollutants include ozone (O_3), particulate matter less than or equal to 10 microns/respirable particulate matter (PM_{10}), particulate matter less than or equal to 2.5 microns/fine particulate matter ($PM_{2.5}$), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. The CARB has developed similar numerical concentration standards based on California Ambient Air Quality Standards for the same seven criteria pollutants in addition to visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

The CARB and U.S. EPA track air quality on an ongoing basis and designate areas or basins as either attainment or nonattainment, based on the measured concentration of criteria pollutants. Ozone is measured over an 8-hour maximum average period, and particulate matter is measured over a 24-hour period. An area can be designated as basic, moderate, serious, severe, or extreme nonattainment depending upon the level of pollutant concentrations. Likewise, if standards for pollutants are met in a particular area, the area is designated as attainment. Areas are designated

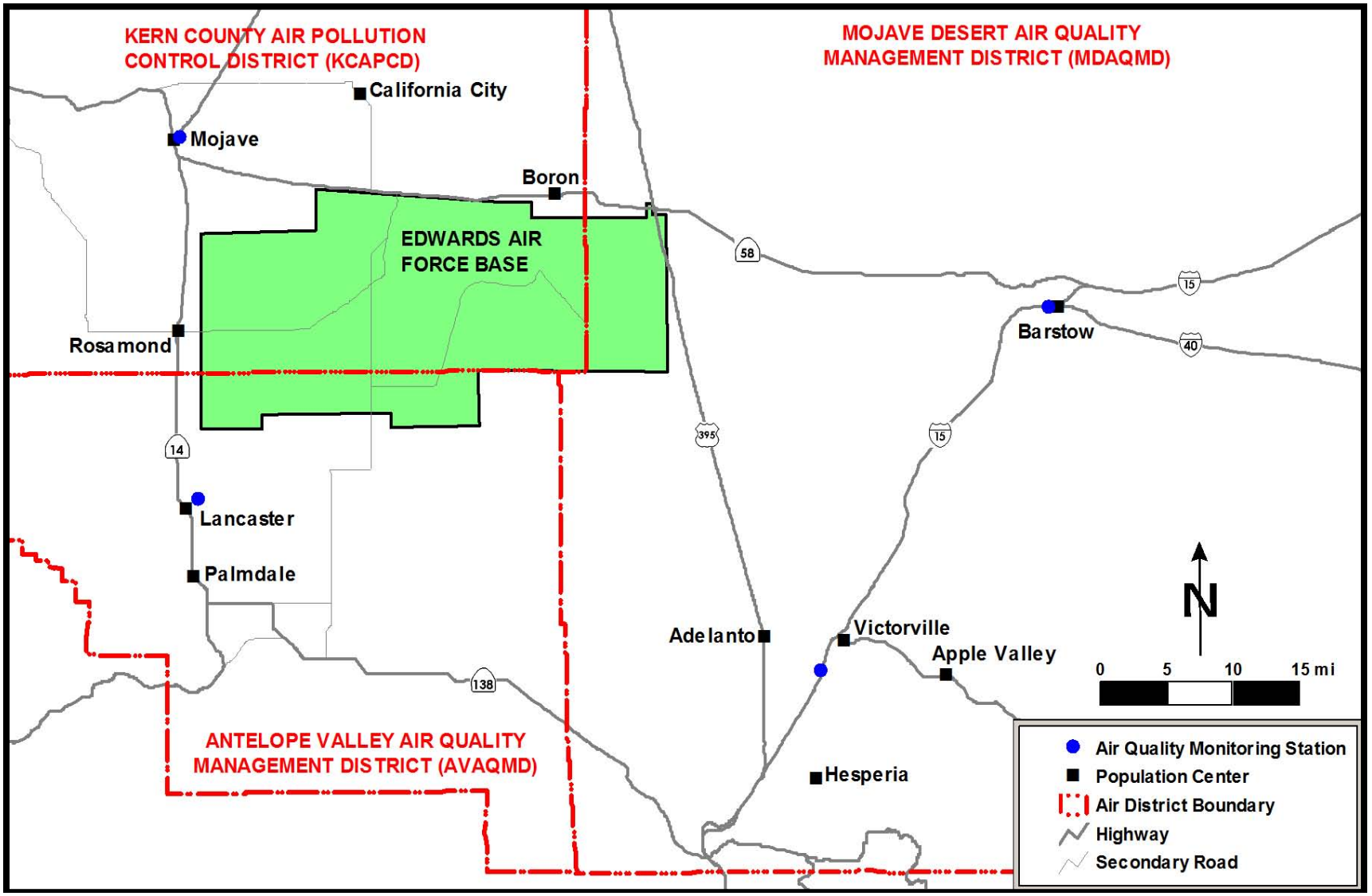


Figure 8. Air District Boundaries

as unclassified when standards have not been established, or when there is a lack of monitoring data for criteria pollutants. Unclassified areas are treated as attainment areas until proven otherwise.

The KCAPCD has been designated Subpart 1 (basic)/nonattainment for the 8-hour O_3 NAAQS, and unclassified/attainment for PM_{10}. The MDAQMD and AVAQMD are both moderate/nonattainment for the 8-hour ozone NAAQS. The AVAQMD is unclassified/attainment for PM_{10} and the MDAQMD is moderate/nonattainment for PM_{10}. The subpart designation indicates an area basin with certain air pollutant requirements. The Subpart 1 designation is a less prescriptive requirement for any pollutants governed by a NAAQS, including O_3. The Subpart 2 designation is a classification scheme for O_3 nonattainment areas and provides more specific requirements for O_3 nonattainment. The NAAQS air quality status for Edwards AFB and surrounding air districts is presented in Figure 9.

3.2.3 **Greenhouse Gases**

Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride that are considered air pollutants associated with climate change. The California legislature passed Assembly Bill (AB) 32, *California Global Warming Solutions Act of 2006*, requiring the CARB to adopt regulations to report and verify statewide GHG emissions, and monitor and enforce compliance with the program. The bill also requires the CARB to adopt a statewide GHG emissions cap equivalent to emission levels in 1990 to be achieved by 2020; and emission levels to be 80 percent below the 1990 levels by 2050. Rules and regulations to implement the procedures of AB 32 are, however, still pending.

Compliance with California AB 32 would require:

a. Completing a GHG inventory, including facility-level GHG emissions assessment;

b. Establishing a GHG data-management and compliance-tracking process;

c. Conducting an emissions-reduction opportunity assessment;

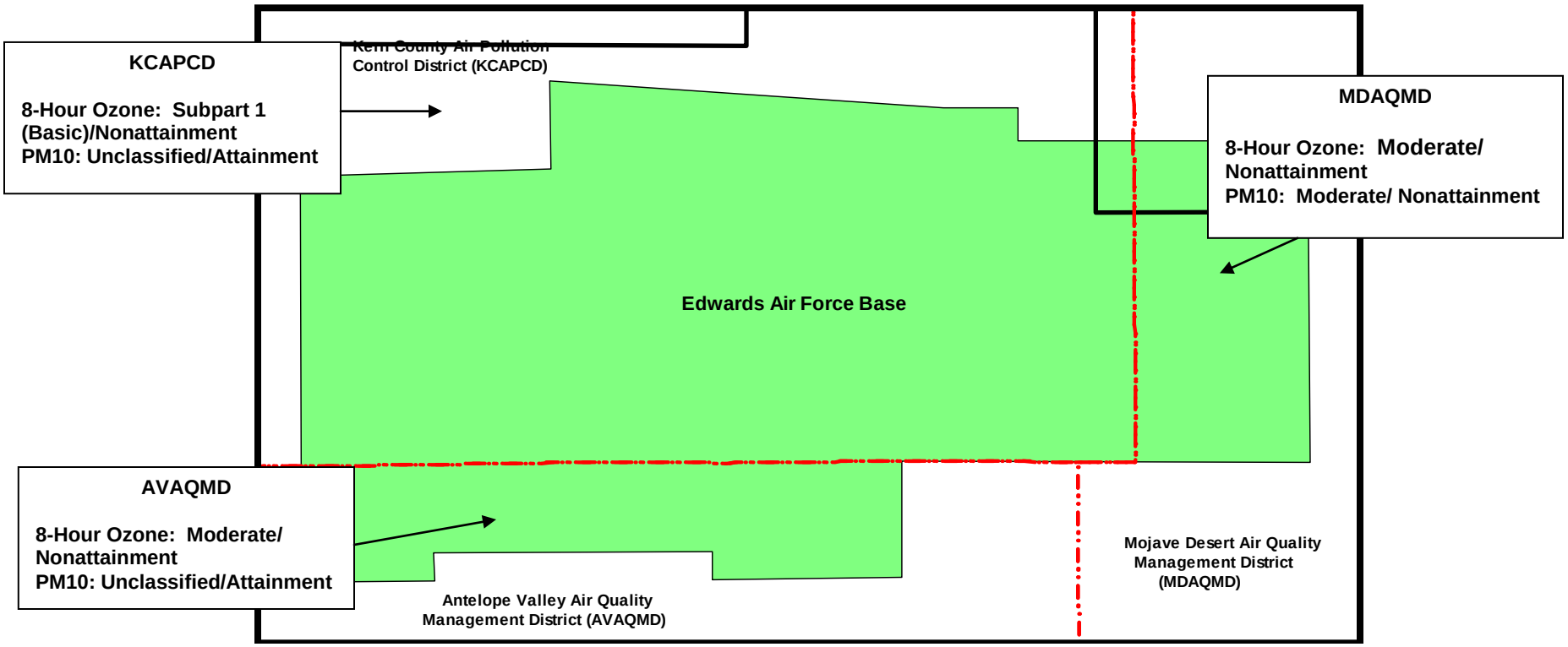
d. Recommending new technologies to reduce GHG emissions;

e. Prioritizing GHG emissions-reduction procedures, including implementing carbon credit market opportunities that may qualify as offsets; and

f. Implementing strategies and communicating GHG emission procedures to basewide organizations.

3.2.4 **Local District Control**

To ensure compliance with relevant federal and state air regulations regarding ambient criteria pollutant concentrations, each air quality control district enacts their own rules and regulations. Local air districts use stationary source new source review (NSR) permits, such as an authority to construct and permit to operate, as means of implementing air quality rules and regulations.



LEGEND

8-Hour Ozone Classifications:

Subpart 1 (Basic): 100-ton limit per pollutant per action per year

Moderate: 100-ton limit per pollutant per action per year.

SOURCE: U.S. EPA website, December 2007

Figure 9. National Ambient Air Quality Standards Attainment Status Map

For KCAPCD, NSR is implemented under KCAPCD Rule 210.1, *New and Modified Stationary Source Review (NSR)*; Rule 1303, *Requirements (New Source Review)*, in MDAQMD; and Rule 1901, *General Conformity*, in AVAQMD. These rules require a review of new and modified stationary sources prior to equipment installation to determine if the generation of air emissions is within ambient air quality standards. These rules also recommend the installation of best available control technology to ensure there are no net increases in air pollutants or their precursors.

In order to enforce these rules, the air districts have established emission levels for new or modified stationary sources of PM_{10}, sulfur oxides (SO_x), nitrogen oxides (NO_x), and volatile organic compounds (VOC) in nonattainment areas (Table 4) that are not significantly disruptive of local attainment plans. Projects that generate emissions in excess of these threshold levels require offsets.

Table 4. New Source Review Threshold Emission Levels

Air Districts	New Source Review Threshold Emission Levels per Pollutant (tons/year)			
	PM_{10}	**SO_x**	**VOC**	**NO_x**
KCAPCD	15	27	25	25
AVAQMD	15	25	25	25
MDAQMD	15	25	25	25

Notes:
1. PM_{10}–particulate matter less than or equal to 10 microns/respirable particulate matter
2. SO_x–sulfur oxides
3. VOC–volatile organic compound
4. NO_x–nitrogen oxides
5. KCAPCD–Kern County Air Pollution Control District
6. AVAQMD–Antelope Valley Air Quality Management District
7. MDAQMD–Mojave Desert Air Quality Management District

Source: California Air Resources Board, 2008

3.2.5 Conformity Requirements

The general conformity rule prohibits any federal action that does not conform to the applicable air quality attainment plan or state implementation plan (SIP), and applies to areas designated as nonattainment or maintenance for NAAQS. Therefore, the purpose of conformity is to ensure federal activities do not interfere with the budgets in the SIP.

All federal actions are included in the SIP unless otherwise exempt (e.g., actions covered by transportation conformity, actions with clearly *de minimis* emissions, exempt actions listed in a rule, or actions covered by a 'presumed to conform' demonstration). Conformity can be demonstrated by:

a. Showing emission increases are included in the SIP;

b. The state agreeing to include increases in the SIP;

c. Areas without SIPs, no new violations of NAAQS, and/or no increase in frequency/ severity of violations;

d. Offsets; and

e. Mitigation.

Some emissions are excluded from conformity determination, such as those already subject to NSR; those covered by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (*CERCLA*) (42 U.S.C. 9601 et seq.) or compliance with other environmental laws; actions not reasonably foreseeable; and those for which the agency has no continuing program responsibility.

A project is exempt from the conformity rule (presumed to conform) if the total net project-related emissions (construction and operation) pass two tests: they are less than the *de minimis* thresholds established by the conformity rule and not regionally significant (emissions are regionally significant if they exceed 10 percent of the total threshold emission inventory). A project that produces emissions that exceed conformity thresholds, or is regionally significant, is required to demonstrate conformity with the SIP through minimization or other accepted practices.

The proposed alternative actions would be located primarily within the eastern portion of Edwards AFB. The area is designated Subpart 1 (basic)/nonattainment for the 8-hour O_3 NAAQS. In accordance with the air conformity requirements of 40 CFR 51.853/93.153(b)(1) and KCAPCD Rule 210.7, *Federal General Conformity Rule*, the *de minimis* level set for O_3 Subpart 1 (basic)/nonattainment areas is 100 tons per O_3 precursor pollutant (NO_x and VOC) per year, per federal action.

The air quality analysis refers almost exclusively to regulatory requirements and air quality impacts in eastern KCAPCD. However, there may be instances when project-related construction vehicles, haul trucks, and tanker trucks travel through adjoining air districts and generate air emissions. Emissions increases in outlying air districts would be considered in the analysis of the applicability of general conformity to the proposed project. The applicable *de minimis* level for O_3 in the MDAQMD and AVAQMD, designated moderate/nonattainment, is also 100 tons per O_3 precursor pollutant (NO_x and VOC) per year, per federal action.

In addition to *de minimis* levels, the NAAQS regional planning emission inventories for KCAPCD, MDAQMD, and AVAQMD would be used to determine the applicability of air conformity requirements to the proposed action. The regional planning emission inventories for O_3 precursor pollutants (NO_x and VOC) are included in the 1994 California O_3 SIP, Volume I (CARB, 1994). In the California O_3 SIP, the regional planning baseline year is 1990. Table 5 presents the 1990 regional baseline emission inventory and the 10-percent threshold values.

3.3 **Water Resources**

Water resources describe the quality, quantity, source, and use of water at Edwards AFB. This includes drinking (potable) water, wastewater, and stormwater. The sources of water on Edwards AFB include groundwater, Antelope Valley-East Kern Water Agency water, treated wastewater (irrigation), and stormwater.

Table 5. 1990 Baseline and 10-Percent Threshold Values

Districts	1990 Baseline Values (tons/year)			10-Percent Threshold (tons/year)		
	NO_x	VOC	PM_{10}	NO_x	VOC	PM_{10}
KCAPCD	14,965	6,205	N/A	1,496.5	620.5	N/A
AVAQMD	10,220	12,775	N/A	1,022.0	1,277.5	N/A
MDAQMD	41,610	16,790	34,310	4,161.0	1679.0	3,431

Notes: 1. NO_x–nitrogen oxides
2. VOC–volatile organic compound
3. PM_{10}–particulate matter less than or equal to 10 microns/respirable particulate matter
4. KCAPCD–Kern County Air Pollution Control District
5. N/A–not applicable
6. AVAQMD–Antelope Valley Air Quality Management District
7. MDAQMD–Mojave Desert Air Quality Management District

Source: California Air Resources Board, 2008.

Edwards AFB has various facilities dedicated to water resources. They include: six chlorination points for potable water, numerous potable and nonpotable water storage tanks, two operating WWTPs (Main Base and Air Force Research Laboratory [AFRL] with associated evaporation ponds), and stormwater retention ponds.

3.3.1 **Stormwater Management**

Edwards AFB has been subdivided into six stormwater management units (SMU): Main Base Flightline, Main Base Miscellaneous, South Base, NASA/DFRC, AFRL, and North Base. These units are defined as nonphysical in that the boundaries reflect tenant lease areas and other organizational areas. In addition to the SMUs, eight stormwater drainage areas (SWDA) have also been delineated in the *Storm Water Pollution Prevention Plan, Edwards Air Force Base, California* (AFFTC, 2002). These SWDAs include the Main Base Flightline South, Main Base Flightline Central, NASA/Main Base Flightline North, South Base, North Base, Piute Ponds, Small Arms Range, and Main Base Outlying Region. These SWDAs are delineated with respect to topographical features. The SWPPP describes each drainage area in detail including watershed association, area covered, containment structures and areas, and facility association.

3.3.2 **Wastewater**

Industrial wastewater is liquid waste resulting from industrial processes: paint stripping, metal plating, maintenance and repair, aircraft and vehicle cleaning, power or heat plant operations, boiler and cooling water discharges, and oil and solvent recovery operations. Wastewater conveyed to the WWTP is required to meet specific pretreatment standards established to ensure that pollutants entering or passing through the WWTP will not have an adverse effect on the treatment process or contaminated sludge (AFFTCI 32-6).

Buildings that generate industrial wastewater are required to process an AFFTC Information Management Tool (IMT) 5852, *Permit for Industrial Wastewater Discharge, Edwards AFB, California* (Wastewater Discharge Permit), prior to discharging any wastewater. The permit must be approved by the Base Civil Engineer, Environmental Management, and Bioenvironmental

Engineering (BEE), and is applicable to all dischargers of industrial wastewater. The Wastewater Discharge Permit ensures compliance with required HAZMAT handling protocols, and should remove significant impacts caused by industrial wastewater to the WWTPs (AFFTC, 1997a). A complete list of wastes prohibited from being discharged into the WWTP can be found in AFFTCI 32-6.

3.4 Safety and Occupation Health

Safety and occupational health is defined as the protection of workers and the public from hazards. The total accident spectrum encompasses not only injury to personnel, but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence.

The potential health and safety issues on Edwards AFB include radiological, biological, chemical, or physical hazards as well as ground and test systems safety.

3.4.1 General Safety

The statutory and regulatory requirements of the federal *Occupational Safety and Health Act* (*OSHA*) and Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) standards that apply to the safety of DOD workers on Edwards AFB are enforced locally by BEE, Safety, and the Fire Department. Air Force Flight Test Center Instruction 11-1, *Air Operations* (2004), and AFFTCI 11-2, *Ground Operations*, address aircrew operations procedures and ground support of aircraft operations, respectively. Health and safety issues related to aircraft operations include ground personnel safety near aircraft during taxiing and inspection activities, safety of aircrews during runway use (lakebed and nonlakebed surfaces), and safety of all personnel during emergency situations such as aircraft malfunction or other mishap. Health and safety as they relate to these two operating areas are addressed in terms of routine procedures and emergency management within the respective AFFTCI.

3.4.2 Exposure Hazards

Exposure to hazardous conditions in the work place and in the outdoor environment can pose a risk to personnel health and safety. Sources of exposure hazards would include the use of directed energy, chemicals, propellants, or gases; the handling of explosives and ordnance; and hazardous noise conditions.

3.4.2.1 Directed Energy

Directed energy is an umbrella term covering technologies that relate to the production of a beam of electromagnetic energy or atomic, or subatomic, particles. Directed energy is the propagation of selected regions of the electromagnetic spectrum emitting radiation energies that have distinct wavelengths and frequencies. Understanding the mechanisms that propagate these electromagnetic waveforms, their radiant beam energies and systems that produce them are the focus of research and developmental test and evaluation testing on base. Directed energy systems that are being investigated are variants of laser (light amplification by stimulated emission of radiation) systems (within the infrared spectrum) and various microwave systems (within the microwave spectrum) (AFFTC, 2006c).

The developmental test and evaluation, and research and development of variant laser and microwave systems are conducted at approved locations on Edwards AFB under scheduled and controlled conditions. Laser systems are regulated under AFOSH 48-139, *Laser Radiation Protection Program* (1997), and Department of Defense Instruction (DODI) 6055.11, *Protection of DOD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers* (2005); and microwave systems under AFOSH 48-9, *Radio Frequency Radiation (RFR) Safety Program* (1997).

Exposure to other directed energy systems including nonionizing electromagnetic radiation from radiofrequency emitters (e.g., radars, radar-jamming transmitters, and radio communication equipment) are regulated IAW AFOSH 48-9. Sources of electromagnetic radiation exist in various locations along the flightline areas including airfield management equipment, aircraft equipment and instrumentation, fixed location radars, and radar-jamming transmitters. Standards and practices are in place to shield and isolate workers from operational hazards of existing electromagnetic radiation sources (AFFTC, 2006c).

Bioenvironmental Engineering periodically makes visits to, and evaluates the operations of, all known AFFTC industrial radiation users as a part of the Industrial Hygiene Surveillance Program. Bioenvironmental Engineering also verifies (annually) the list of radio frequency radiation emitters and low-power laser systems used on Edwards AFB. Any proposed use of emitters is evaluated using a preliminary radiation and lasing hazard analysis. Using a permissible exposure limit and maximum probable exposure limits, a proper hazard analysis is accomplished (95 ABW, 2008). The permissible exposure limit and maximum permissible exposure are expressed in terms of safe distance limits from the emitting source. Compliance with these limits is required as a standard operating procedure (AFOSH 48-9). The *Environmental Assessment for the Testing and Evaluation of Directed Energy Systems Using Laser Technology at Edwards Air Force Base, California* (AFFTC, 2006c) contains a full analysis of the exposure hazards associated with directed energy systems.

3.4.2.2 **Chemical Hazards**

Exposure to chemical hazards could occur during routine operations including maintenance, and technology and systems development. Chemical hazards include, but are not limited to, asbestos-containing materials (ACM), engineered nanomaterials, coating compounds (e.g., lead-based, low-observable, and heavy-metal paints), commercial polychlorinated biphenyls (PCB), specialized cleaning agents, pesticides, oils, refrigerants, lubricants, and fuels.

Asbestos dust particulates and friable ACMs could be encountered during repairs to equipment and other routine flightline activities. Dust particulates of lead-based, low-observable, and heavy-metal paints could be encountered during the handling or maintenance of painted metal parts, equipment, and pipelines. Weed and pest abatement activities could potentially expose personnel to pesticides and herbicides. Personnel could be exposed to residual fuels and fuel vapors during routine maintenance of aircraft, equipment, pipelines, or fuel storage tanks along the flightlines.

3.4.2.3 **Explosives, Ordnance, and Propellants**

Explosives, ordnance, and propellants are stored in a number of locations throughout Edwards AFB. An inhabited-building separation distance (or clear zone) has been established around each of the existing explosives, ordnance, and/or propellant use/storage locations. The size of the clear zone varies based on the quantity and type of explosive used, or propellant stored. Clear zones ensure the safety of all personnel in the area from the potential overpressure hazard associated with use and storage of these materials (AFJMAN 91-201).

3.4.2.4 **Hazardous Noise**

Hazardous noise exposure occurs when workers are present in areas where ambient noise levels exceed 85 decibels. Title 29 CFR Section 1910.95, *Occupational Noise Exposure*, states that protection against the effects of noise exposure should be provided when the sound levels exceed those shown in the regulation. Figure 10 compares the relative noise of common sounds.

Aircraft operations and machinery/equipment including, but not limited to, skids, grinders, pneumatic hammers and drills, concrete saws, vibrating compactors, bulldozers, backhoes, graders, and cable plows are the primary sources of noise in flightline areas.

To prevent potentially harmful effects to military and DOD civilian personnel from exposure to hazardous noise, Edward AFB has established protective measures in compliance with AFOSH Standard 48-19, *Hazardous Noise Program* (1994). Under this program, BEE is responsible for conducting hazardous noise surveillance to determine if military or DOD civilian personnel working in hazardous noise areas require engineering or administrative controls. Non-DOD civilian personnel working on the installation are exempt from AFOSH Standard 48-19, but must comply with applicable federal and state regulations. An example of noise levels along the Main Base flightline is presented in the noise contour map in Figure 11. Noise levels are expected to be similar for all flightlines.

3.4.2.5 **Environmental Hazards**

Environmental conditions exist at Edwards AFB that can present physical/health hazards. Personnel working outdoors could experience heat stress during the summer, encounter venomous snakes, and may be exposed to valley fever spores from spore hosting soil.

3.5 **Hazardous Materials/Waste and Solid Waste**

A HAZMAT is any material whose physical, chemical, or biological characteristics, quantity, or concentration may cause or contribute to adverse effects in organisms or their offspring; pose a substantial present or future danger to the environment; or result in damage to or loss of equipment, property, or personnel.

Hazardous wastes are those substances that have been “abandoned, recycled, or are inherently waste-like,” and that (because of their quantity, concentration, or characteristics) have the potential to cause an increase in mortality, serious irreversible illness, or pose a substantial hazard to human health or the environment if improperly treated, stored, transported, and/or discarded.

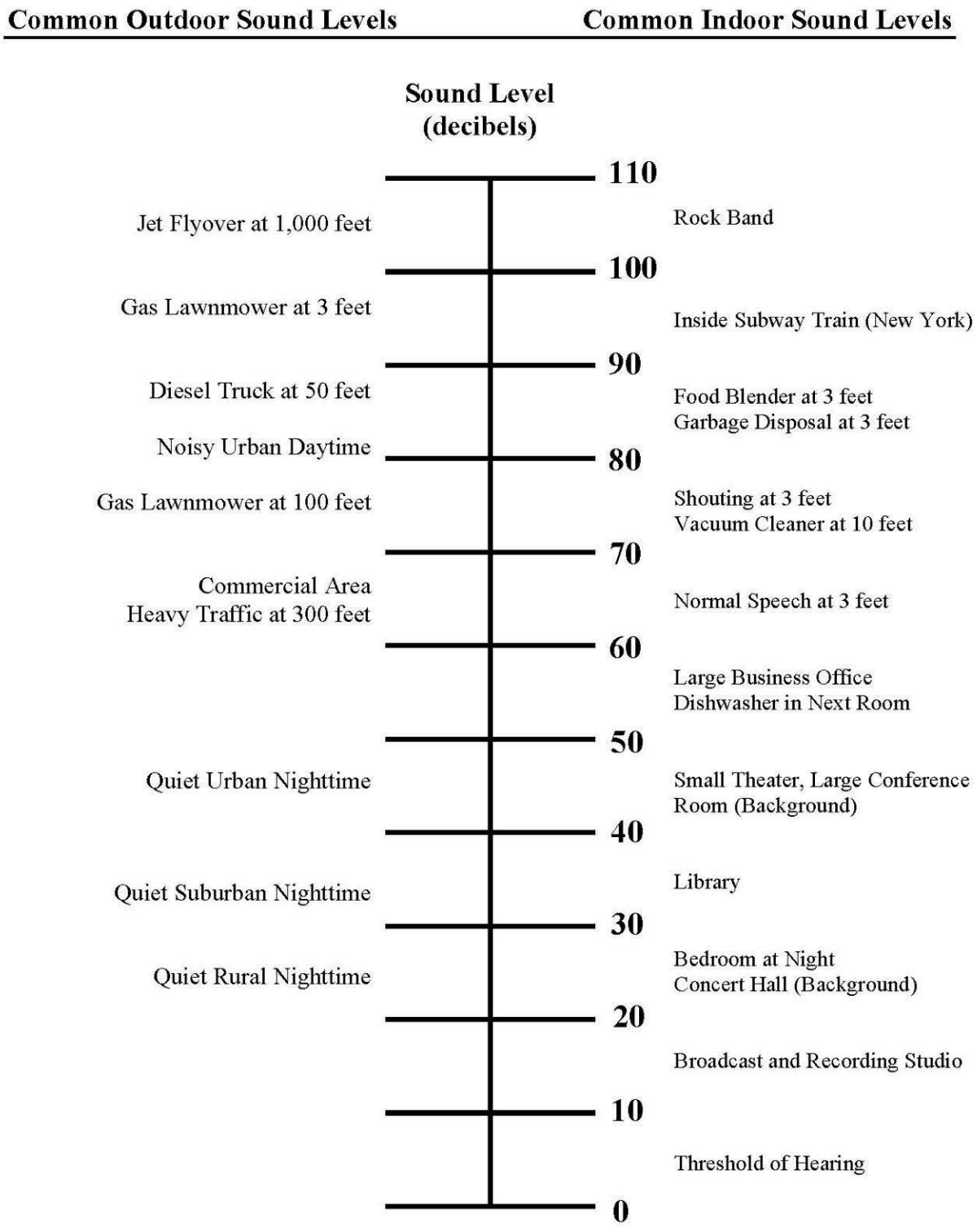


Figure 10. Sound Comparison Table

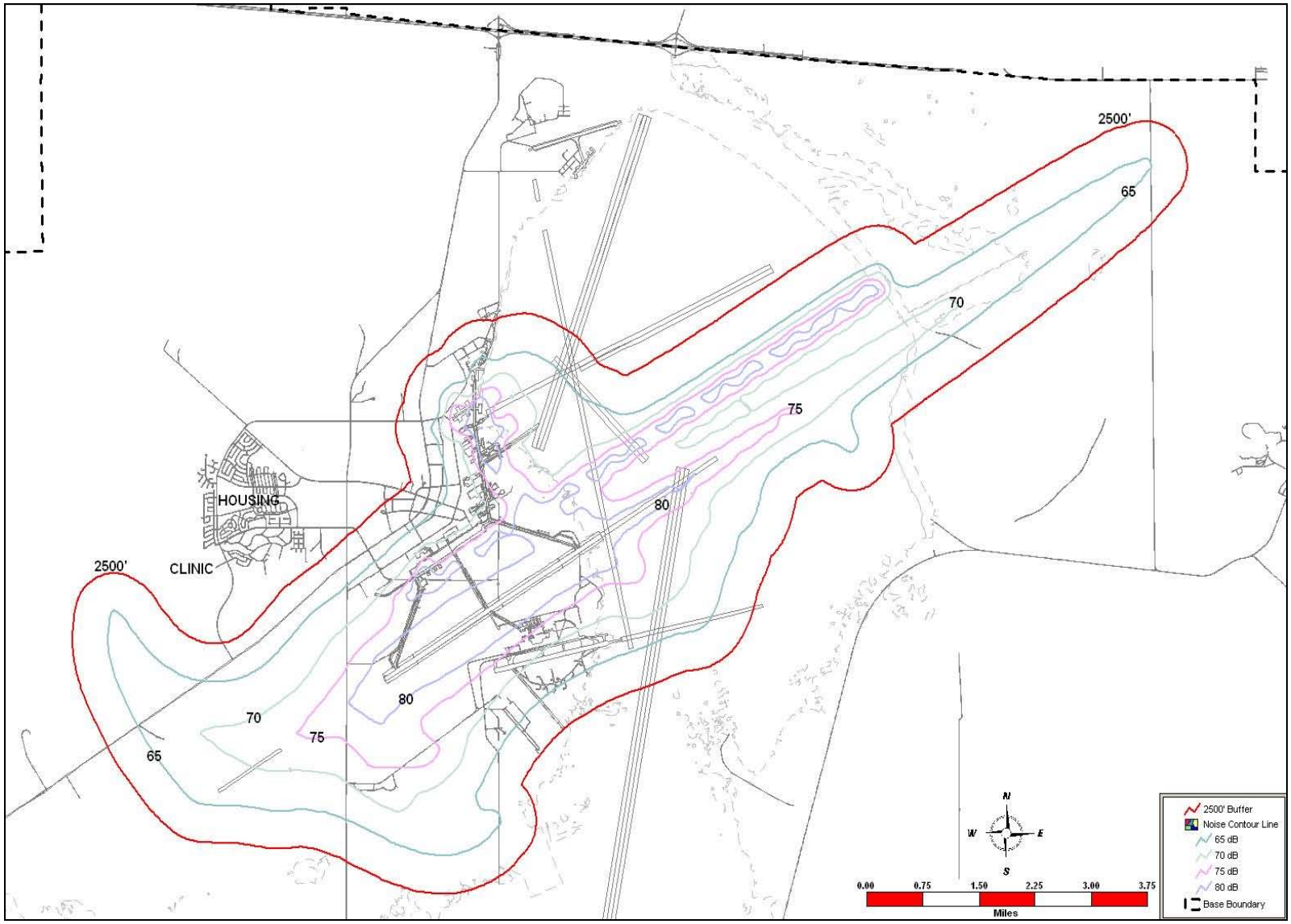


Figure 11. Noise Contours along the Main Base Flightline

For purposes of this analysis, the terms HAZMAT and hazardous waste are those substances as defined by the *CERCLA, Resource Conservation and Recovery Act of 1976* (*RCRA*) (42 U.S.C. 6901–6991), and *Toxic Substances Control Act* (*TSCA*) of 1976 (15 U.S.C. 2601 et seq.).

Solid waste refers to any nonhazardous garbage or refuse, sludge, and other discarded material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. Solid waste can be classified as construction/demolition, nonhazardous recyclable, or nonhazardous nonrecyclable waste.

3.5.1 **Hazardous Materials**

Edwards AFB uses and stores a variety of HAZMAT for routine flightline activities. Hazardous materials are used for aircraft repair and maintenance, aircraft launch and recovery, and use of TSE and AGE. Hazardous materials used at flightline areas include, but are not limited to, paints, thinners, weapons, coolants, corrosives/caustics, cleaning/degreasing solvents, batteries, pesticides, hot asphalt, compressed gases/propellants, sealants, adhesives, cements, caulking, fire retardants, and various types of petroleum, oils, and lubricants. Building and facility maintenance require the use of heating fuels, paints, and aerosols, all of which are HAZMAT.

Edwards AFB and NASA/DFRC use the pharmacy concept to issue HAZMAT for use by all personnel. Implementation of the HAZMAT Pharmacy approach in the 1980s accomplished several important management goals, including reducing the volume of HAZMAT purchased and hazardous wastes generated through improved materials management. The HAZMAT Pharmacy monitors shelf life and tracks usage of HAZMAT on base. One common database is used to manage issued HAZMAT products. Hazardous materials purchased through the pharmacy are bar code labeled upon their arrival at Supply Central Receiving and distributed to the various satellite issue points or HAZMAT Distribution Support Centers located throughout Edwards AFB (95 ABW, 2005a).

All organizations and contractors are required to maintain inventories of all their HAZMAT. Furthermore, organizations are required to reduce the quantity of HAZMAT purchased and used, or replace HAZMAT with non-HAZMAT, if possible, as part of the Pollution Prevention Program. Guidelines used by Edwards AFB include AFI 32-7086, *Hazardous Materials Management* (2004), and its AFMC Supplement 1 (2006); and EAFBI 32-119, *Edwards Air Force Base Hazardous Material Management Process* (2008).

3.5.2 **Hazardous Waste**

Hazardous wastes that require proper handling would be generated as a result of activities occurring on the flightline. Air Force Flight Test Center Instruction 23-1, *Hazardous Material Management Program*, provides guidelines for the generation, storage, transportation, and disposal of hazardous waste. The California Environmental Protection Agency enforces hazardous waste laws documented in Title 22 California Code of Regulations (CCR) Division 4.5, *Environmental Health Standards for the Management of Hazardous Waste*, and California Health and Safety Code (H&SC) Division 20, Chapter 6.5, *Hazardous Waste Control*.

Guidelines used by Edwards AFB include the *Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042* (HWMP) (95 ABW, 2005a), which was prepared IAW

AFI 32-7042, formerly titled *Solid and Hazardous Waste Compliance*. The HWMP establishes procedures to achieve compliance with applicable federal, state, and local regulations for hazardous waste management. Specifically, it contains requirements for hazardous waste characterization, training, accumulation, turn-in and disposal, inspections, permits, and record keeping.

The transportation of hazardous waste is governed by Department of Transportation regulations that specify procedures for transporting these materials on public roads (49 CFR 100–199; 40 CFR 260–299; and 22 CCR Division 4.5, Chapter 13).

3.5.3 **Solid Waste**

Edwards AFB operates a nonhazardous municipal solid waste landfill within the Main Base area and a processing area for inert debris such as concrete and asphalt. Currently, Edwards AFB has an established procedure for staging, processing, and recycling inert debris (concrete and asphalt) and disposing of construction and demolition debris. Inert debris is stockpiled in specified areas according to Civil Engineering instruction. The volume of construction and demolition debris is minimized by segregating recyclable materials to the maximum extent practicable before demolition. The remaining construction and demolition debris and other construction-related solid waste are sent to an approved, state-licensed landfill for recycling and/or disposal.

The base actively participates in a solid waste recycling program. Recycling is the use, reclamation, and reuse of a material. Air Force Instruction 32-7080, *Pollution Prevention Program* (1994), requires the base to recycle and states, "Each installation will strive to recycle as much of the solid waste stream as possible. As a minimum, each qualified recycling program will recycle metals, plastic, glass, used oil, lead acid batteries, tires, high quality copier paper, cardboard, and newspaper." A contractor operates the recycling program under contract with Edwards AFB, with program oversight provided by Civil Engineering and Environmental Management.

3.6 **Biological Resources**

Naturally occurring organisms, the physical and biological aspects of their environment, and the relationships between them make up biological resources. Biological resources include native and introduced plants that comprise various vegetative habitats, the animals that are found in such habitats, and the physical areas that support plant and wildlife populations.

Edwards AFB contains and manages biological resources that are typical of a desert environment. These include animal and plant species (including the associated habitats of each), floodplains, and watersheds. Although protection of nonlisted species is not mandatory on federal installations, management of nonlisted species contributes to the overall maintenance of their natural populations and reduces the likelihood that these species would have to be given additional legislative protection in the future. Edwards AFB also manages nonfederally listed species through the use of general conservation measures outlined in the *Integrated Natural Resources Management Plan for Edwards Air Force Base, California, AFFTC Plan 32-7064* (95 ABW, 2004b); and its update, Edwards AFB Plan 32-7064 (95 ABW, 2007).

3.6.1 **Animal Species**

While there are several species of interest at Edwards AFB, there is only one listed species with legally required mandates on management practices, the desert tortoise (*Gopherus agassizii*). The desert tortoise is federally listed as threatened under the *Endangered Species Act of 1973 (ESA)* (16 U.S.C. 1531 et seq.) and state listed as threatened by the California State Fish and Game Commission. The desert tortoise is an herbivorous reptile whose native range includes the Sonoran and Mojave deserts of southern California, southern Nevada, Arizona, extreme southwestern Utah, and Sonora and northern Sinaloa, Mexico. Desert tortoises are known to inhabit Edwards AFB. The borrow sites that would be used to support routine flightline activities are located within desert tortoise habitat (Figure 12). Borrow sites and their use are covered under the *Biological Opinion for the Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (Appendix E) which authorizes use of Borrow Sites A, B(16), C, 1, 5, 21, 23, and 28.

The burrowing owl (*Athene cunicularia*) is currently a federal and California species of concern and is also protected under the auspices of the *Migratory Bird Treaty Act of 1918 (MBTA)* (16 U.S.C. 703–712). It is a small, ground-dwelling bird with a round head that lacks the tufts of feathers, which are often referred to as ear tufts, associated with owls. It has white eyebrows, yellow eyes, and long stilt-like legs. Burrowing owls are found in open, dry grasslands, agricultural and range lands, including areas adjacent to the flightlines. On Edwards AFB, burrowing owls are known to inhabit manmade cover features such as irrigation pipes and culverts along graded road shoulders, as well as natural cover features such as animal (e.g., desert tortoise, desert kit fox [*Vulpes macrotis*], or badger [family Mustelidae]) burrows or dens.

Common animal species found in Main Base, North Base, South Base, and lakebed areas include the black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audobonii*), deer mouse (*Peromyscus maniculatus*), grasshopper mouse (*Onychomys torridus*), little pocket mouse (*Perognathus longimembris*), Merriam's kangaroo rat (*Dipodymus merriami*), Antelope ground squirrel (*Ammospermophilus leucurus*), coyote (*Canis latrans*), desert kit fox, side-blotched lizard (*Uta stansburiana*), and western whip-tail lizard (*Cnemidophorus tigris*). For a list of common animals found at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report, Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al., 1993).

Flightline areas provide habitat for birds including the barn owl (*Tyto alba*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*). Additionally, the turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), sage sparrow (*Amphispiza belli*), barn owl, house finch (*Carpodacus mexicanus*), and red-tailed hawk (*Buteo jamaicensis*) may be found in the area. Common bird species found in creosote bush (*Larrea tridentata*) scrub, in the area of the flightline, include the horned lark, black-throated sparrow (*Amphispiza bilineata*), and sage sparrow. Seasonal rains on lakebeds and claypans near the flightline attract wading bird species, including the black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), and greater yellowlegs (*Tringa flavipes*). Birds associated with ponds include the yellow-headed blackbird (*Xanthocephalus xanthocephalus*), black-crowned night heron (*Nycticorax nycticorax*), and green heron (*Butorides virescens*). Seasonal migratory birds use both permanent and temporary bodies of water for resting and foraging.

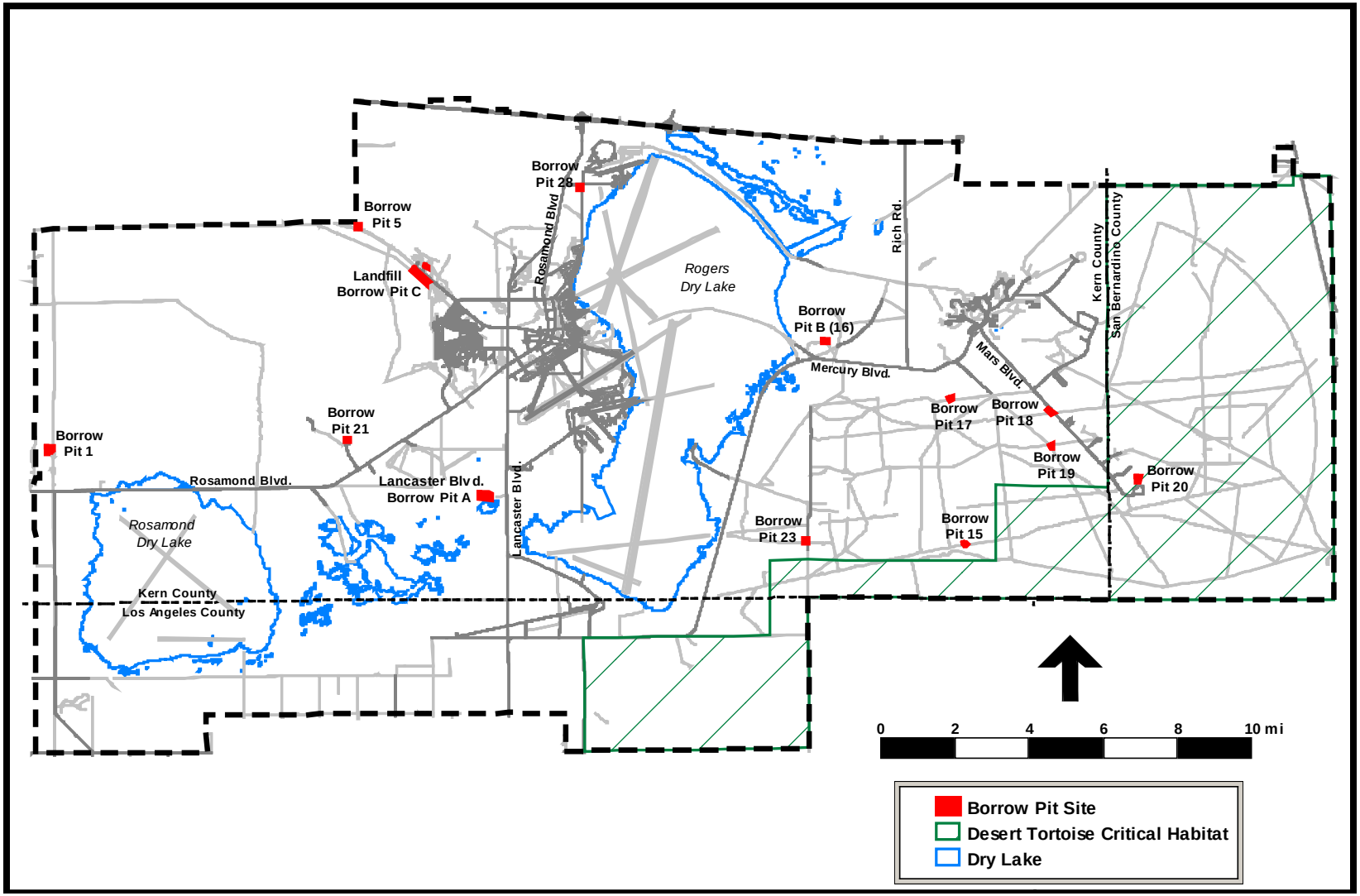


Figure 12. Borrow Sites and Desert Tortoise Critical Habitat

These birds include ducks and geese, such as the ruddy duck (*Oxyura jamaicensis*), northern mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), Canada goose (*Branta canadensis*), and snow goose (*Chen caerulescens*). Migratory birds are protected under the *MBTA* and a depredation permit is required prior to depredating or removing any migratory bird, nest, or young. Bats migrating through the area could use the trees for roosting and the area for foraging on flying insects around the ponds. Potential bats include the western pipistrelle (*Pipistrellus hesperus*), little brown bat (*Myotis lucifugus*), Mexican free-tail bat (*Tadarida brasiliensis*), and western mastiff bat (*Eumops perotis*).

3.6.2 **Plant Species**

Main Base, North Base, South Base, and lakebed flightline areas are located in xerophytic phase salt bush (*Atriplex* sp.) scrub plant habitat. Plant species common to the area include allscale saltbush (*Atriplex polycarpa*), spinescale saltbush (*Atriplex spinifera*), four-wing saltbush (*Atriplex canescens* ssp. *canescens*), spotted milkvetch (*Astragalus lentiginous*), alkali rubber rabbit-brush (*Chrysothamnus nauseosus* spp. *Mohavensis*), creosote bush, split grass (*Schismus barbatus*), and brome species (*Bromus* sp).

Five sensitive plant species are known to occur on Edwards AFB: desert Cymopterus (*Cymopterus deserticola*), Barstow woolly sunflower (*Eriophyllum mohavense*), sagebrush loeflingia (*Loeflingia squarrosa* ssp. *artemisiarum*), Lancaster milkvetch (*Astragalus preussii* var. *laxiflorus*), and alkali Mariposa lily (*Calochortus striatus*). These plants are considered rare or endangered in California and elsewhere. The alkali Mariposa lily is known to occur near the Main Base and South Base flightline areas and is a federal species of concern listed as 1B (plants of very limited distribution, global populations are potentially threatened) by the California Native Plant Society.

Creosote bush scrub habitat can be found in some areas being considered for routine flightline activities. Incidental plant species observed for one such area—Sopp Field—include cheese bush (*Hymenoclea salsola* var. *salsola*), Joshua tree (*Yucca brevifolia* var. *brevifolia*), vinegar weed (*Lessingia lemmonii*), rabbit brush (*Chrysothamnus nauseosus*), Cooper's goldenbush (*Ericameria cooperi* var. *cooperi*), Nevada tea (*Ephedra nevadensis*), peachthorn (*Lycium cooperi*), red stem filaree (*Erodium cicutarium*), wire lettuce (*Stephanomeria pauciflora*), desert buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), Indian rice grass (*Achnatherum hymenoides*), desert dandelion (*Malacothrix* sp.), and burrobush (*Ambrosia dumosa*) (AFFTC, 1996a).

3.7 **Cultural Resources**

Cultural resources are defined by AFI 32-7065, *Cultural Resources Management* (2004), as any historical, archaeological, or American Indian artifacts and properties of interest. Cultural resources at Edwards AFB include archaeological resources, from prehistoric and historic periods; historic period resources, including historic period structures and objects; and traditional cultural places.

As of September 2008, over 3,723 archaeological sites had been identified on Edwards AFB. Of these, over 1,863 sites represent the prehistoric period and over 1,860 date to the historic period. Prehistoric period sites include villages, temporary camps, rock shelters, milling stations, lithic deposits, quarries, cremations, rock features, and rock art. Historic period archaeological

sites include refuse deposits, rock cairns, railroad grades, roads and trails, abandoned mines and homesteads, rock alignments, wells, and military sites. Of these, 1,120 sites have been evaluated for listing on the National Register of Historic Places (NRHP); 262 of these sites have been found eligible for listing on the NRHP either on individual merit or as contributing elements of historic districts. There is one National Historic Landmark on Edwards AFB, which is in the northern portion of Rogers Dry Lake. In addition, there are 112 buildings that have been found eligible for listing on the NRHP.

3.7.1 **Prehistoric Archaeological Resources**

A number of American Indian groups are known ethnographically to have used the Antelope Valley to hunt and gather food from areas surrounding prehistoric Lake Thompson (precursor to Rosamond and Rogers Dry Lakes) and groundwater springs that occurred in the region. The groups known to have inhabited the region included Kawaiisu, Tataviam, Kitanemuk, and Vanyume or Desert Serrano. Additional information on these groups can be found in the *Cultural Resources Overview and Management Plan of Edwards AFB, California, Volume 1, Overview of the Prehistoric Cultural Resources* (Earle et al., 1997).

Prehistoric period sites include villages, temporary camps, rock shelters, milling stations, lithic deposits, quarries, cremations, rock features, and rock art. These sites have been evaluated in ongoing site evaluations by the Environmental Management Cultural Resources group. Currently, there are 97 prehistoric cultural sites (archaeological sites) that have been determined eligible for the NRHP.

3.7.2 **Historic Resources**

Historic land use in the Antelope Valley was limited to mineral exploration activities until the middle of the 19th century. During the late 19th and early 20th centuries, land use activities in the area of Edwards AFB included precious metal exploration, development of railroad rights-of-way, ranching, and homesteading. Evaluation of historic sites on Edwards AFB is ongoing and conducted by the Environmental Management Cultural Resources group. Currently, there are 146 historic sites that have been evaluated and determined eligible for the NRHP.

Significant dates in the historic development of the Edwards AFB area were:

a. 1909–The town of Muroc was founded and located east of the present-day air traffic control tower on the Main Base Flightline.

b. 1910–The Atchison, Topeka, and Santa Fe Railroad, between Mojave and Barstow, was constructed across the dry lakebed and passed through the town of Muroc.

c. 1928–The Muroc area was used for military exercises.

d. 1934–A bombing and gunnery range was established at Rogers Dry Lake adjacent to the Muroc area.

e. 1941–The Muroc Bombing and Gunnery Range headquarters was established on the west shore of Rogers Dry Lake (currently South Base).

f. 1942–Muroc Flight Test Base was established as a separate facility at the northern end of Rogers Dry Lake (currently North Base).

g. 1943–The bombing and gunnery range was renamed Muroc Army Air Field.

h. 1947–Muroc Army Air Field was combined with Muroc Flight Test Base and renamed Muroc AFB.

i. 1949–Muroc AFB was renamed Edwards AFB.

j. Mid-1950s–The majority of base operations was moved to new facilities that comprise the current Main Base.

3.8 Geology and Soils

Geologic resources consist of naturally-formed minerals, rocks, and unconsolidated sediments. Soil refers to the uppermost layers of surficial geologic deposits and is developed by the weathering of those deposits. Concerns associated with the geologic setting at Edwards AFB include availability of borrow sites for fill material, projects located in the vicinity of geologic faults, land subsidence, and disturbances to ERP sites and associated remediation equipment.

The United States Department of Agriculture prepared a soil survey of Edwards AFB for the United States Army Corps of Engineers (USACE) (USACE, 1997). The report reveals that the erosion hazard rating for soils found in the area range from slight to severe for wind erosion and slight to moderate for water erosion.

3.8.1 Fill Material

The source of fill material would come from excess recycled asphalt and concrete or other approved borrow sites. Fill material for some flightline activities (e.g. grading of lakebed) come from approved borrow sites (Anderson, 2007). *The Environmental Assessment for Borrow Sites at Edwards Air Force Base, California* (AFFTC, 1996a) discusses the environmental condition, advantages, and disadvantages associated with the use of on-base borrow sites. It identifies five sites (1, 5, 21, 23, and 28) in addition to those in use prior to 1996. See Figure 12 for the locations of on-base material borrow sites. The borrow sites have had a cultural resource site survey performed over a 5-acre area at each site. Partial surveys were performed over a 40-acre area at some of the borrow sites. Cultural surveys at Borrow Site B(16) found cultural artifacts of lithic fragments indicating prehistoric habitation. There is a high probability that further excavation at the borrow sites may uncover additional cultural artifacts and prehistoric sites. Cultural surveys performed at the remaining active borrow sites have not found indications of cultural artifacts. The probability of finding prehistoric sites in these areas remains low.

3.8.2 Subsidence Features

Land subsidence features appear on the dry lakebeds in the form of surface cracking, fissures, solution cavities, and small surface depressions. The subsidence features are associated with surface water runoff after rain shower events and subsequent groundwater flow through the lakebed sediments.

Erosion of the lakebed substratum occurs when groundwater flows through the sediments causing void spaces. When these void spaces collapse from weight of the overburden,

subsidence features appear at the surface. Subsidence features tend to increase in number and magnitude during stormwater runoff and drainage onto the lakebed areas (AFFTC, 2002).

Runways on the dry lakebed that are affected by subsidence features are shut down until surface repairs are made. During shutdown periods, the runways cannot be used for emergency landings or flight test operations.

3.8.3 Seismic Activity

The Mirage Valley Fault is a northwest trending fault that extends from South Base through Main Base. The fault is seismically dormant with no record of earthquake activity along its trace. Earthquakes have occurred along local faults in the vicinity of Edwards AFB with magnitudes less than 4.4 on the Richter scale with no reported damage to structures. Near Bissell, approximately 2 miles northwest of the base, an earthquake of 4.6 to 6.5 on the Richter scale was recorded. The earthquakes were accompanied by ground motion with little or no ground displacement or structural damage to buildings (95 ABW, 2009b). Numerous minor faults are known, or suspected due to their trends, to be present within the boundaries of Edwards AFB. Figure 13 is a local fault seismicity map that shows the surface traces of these faults.

3.8.4 Environmental Restoration Program

Release of hazardous chemicals, such as petroleum products and solvents, have caused both soil and groundwater contamination on Edwards AFB. Contaminated soil or groundwater may require physical removal or extensive remediation to ensure the protection of public health and safety. The remediation of contaminated sites is conducted under the ERP. The ERP was established to identify, investigate, assess, and clean up hazardous waste at former storage and disposal sites as required by *CERCLA* and *RCRA*. In order to conduct remediation of the sites, Edwards AFB has been divided into ERP management areas termed operable units. Possible action alternatives discussed in this EA would be conducted within these units (Figure 14).

Restoration efforts usually involve extraction and/or the installation of monitoring wells drilled down to the contaminated zones, or deeper. Depth to groundwater in the area ranges from 10 feet below ground surface to over 50 feet below ground surface. Extraction wells are connected by a series of underground or aboveground pipes that convey contaminated fluids or product to treatment facilities for remediation and disposal. Monitoring wells are installed to observe the effects of groundwater remediation activities or track possible contamination from product spills. The well locations are based on the extent of the contaminated groundwater and the hydrogeology of the area. Since some ERP sites require long-term remediation, field equipment such as extraction and monitoring wells, treatment facilities, and associated piping must remain undisturbed and avoided whenever possible.

Surface soil contamination resulting from chemical and petroleum spills were also identified. These areas occur at various locations in the vicinity of the flightline. The sites were designated as areas of concern and were further investigated to characterize the extent of soil contamination. Contamination levels at many of the areas of concern were found to be below action levels and received regulatory closure.

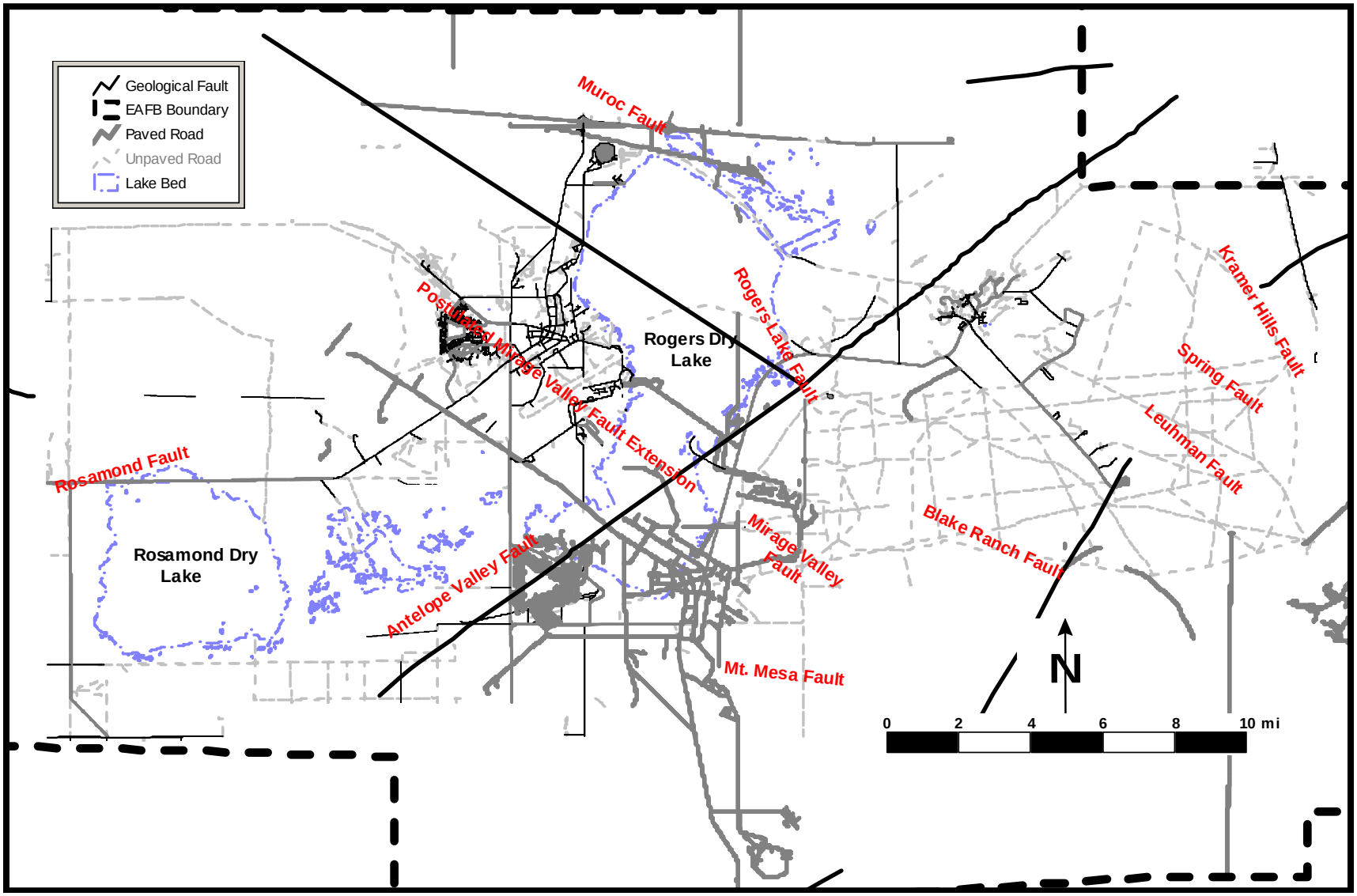


Figure 13. Location of Geologic Faults on Edwards AFB

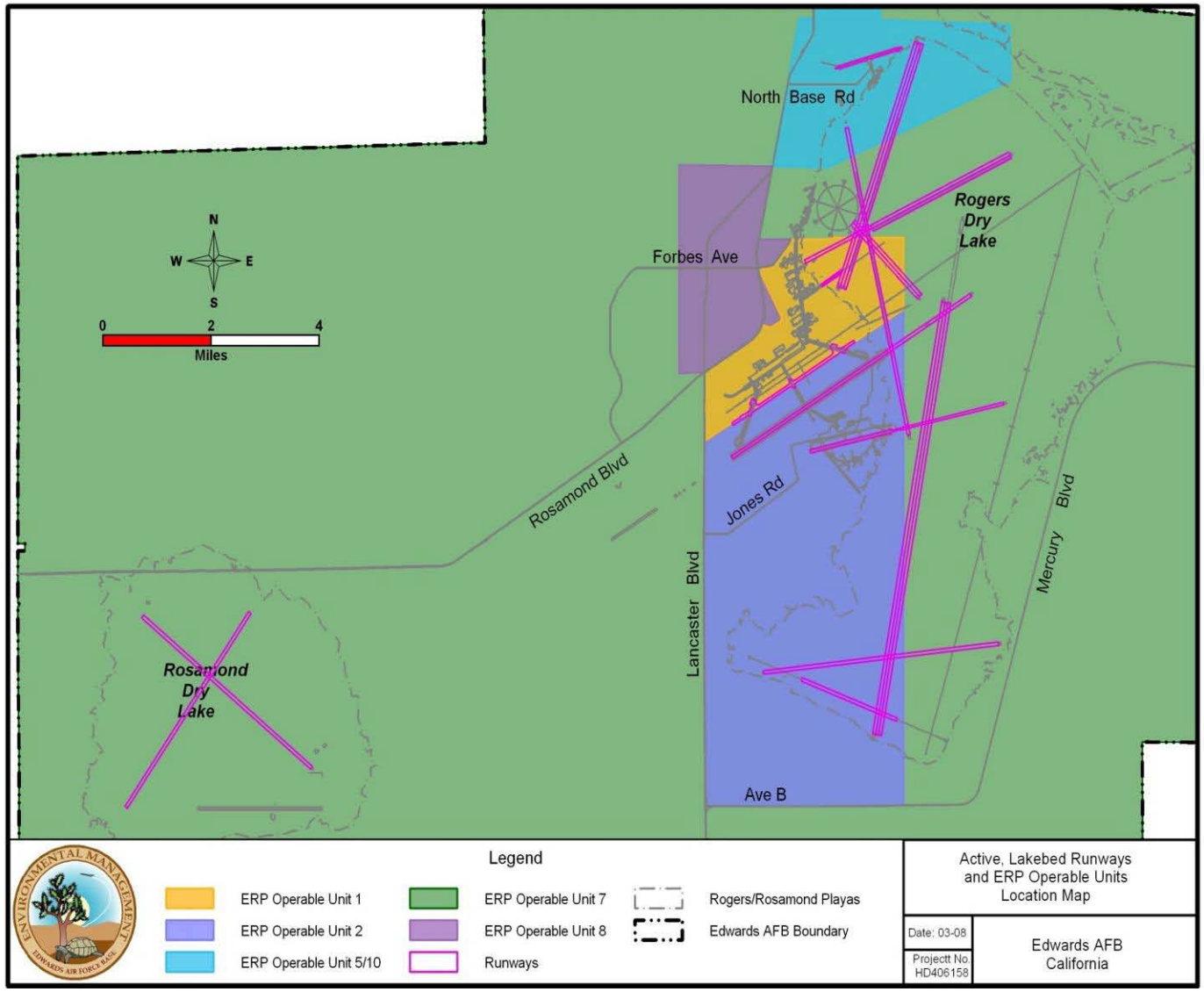


Figure 14. Location of the Affected Operable Units at Edwards AFB

3.9 **Socioeconomic**

Socioeconomic resources are the economic, demographic, and social assets of a community. Key elements include fiscal growth, employment, housing, construction materials, and retail services. The economic impact region for Edwards AFB is the area located within 75 miles of Main Base, and includes portions of Los Angeles, Kern, and San Bernardino Counties. The majority of socioeconomic impacts from base activities would be expected to occur within the Antelope Valley area.

The operations at Edwards AFB have a substantial impact to the economic status of the surrounding communities in the Antelope Valley region. The amount of goods and services purchased quarterly is approximately $9.6 million, or about $38 million annually (AFFTC, 2007).

3.10 **Infrastructure**

Infrastructure refers to the physical components that are used to deliver utilities to the point of use. Elements of the base infrastructure system include water, wastewater, electricity, natural gas, liquid fuel pipelines, communication lines (e.g., telephone and computer), and transportation systems (e.g., streets and railroads) that run in a network throughout the base.

3.10.1 **Fuel Handling**

The *Environmental Assessment for the Maintenance, Upgrade, and Construction of the Jet Fuel Distribution System Edwards Air Force Base, California* (95 ABW, 2009b) provides additional information regarding fuel systems.

"Fuels Supply Management includes the operation, control, distribution, inventory, receiving, storage, and documentation of all aviation/ground fuel and propellants required for aircraft and ground support on Edwards AFB. Quality-control inspections on each fuel type and management of LOX [liquid oxygen], nitrogen, and propellants storage areas on the flightline are also provided" (AFFTC, 2001b).

Jet fuel is delivered to the flightline areas through hydrant and pumping stations. Excess fuel is stored in aboveground storage tanks located at the bulk fuel storage tank farm in the northern part of Main Base (Figure 15) (95 ABW, 2009b).

Currently, Jet Propellant Type 8 is delivered to the base through a pipeline at a rate of 1 million gallons per month. During major flight test and development missions, flow rates generally increase to 2.5 million gallons per month. Alternate fuels are also stored on base and include jet propellant type 5, gasoline, diesel, biofuel, and synthetic fuel (e.g. Fischer-Tropsch fuels). These fuels are delivered to the base by tanker trucks (95 ABW, 2009b).

3.10.2 **Transportation System**

Primary access to Edwards AFB from the adjacent roadways is by way of three gates, each in operation 24 hours per day, 7 days per week. The West Gate is accessed via Rosamond Boulevard, which provides primary access to Edwards AFB from the west and north. The north

Figure 15. Fuel Storage Areas

gate is accessed via North Lancaster Boulevard off of Highway 58, which also provides access from the north. The south gate is accessed via Lancaster Boulevard/120th Street East, which provides access from the south. Internal circulation on base is by way of paved and unpaved primary, secondary, and tertiary roads. Two rail spurs, one at Edwards AFB Station and the other at Boron Station, connect to Main Base and the AFRL, respectively. The spurs connect the two railroads adjacent to the base (95 ABW, 2009b). Section 3.9.2 of the *Environmental Assessment for the Renovation and Construction of a Modern Flight Test Complex, Edwards Air Force Base, California* (AFFTC, 2003b) provides additional information regarding transportation systems.

3.10.3 **Utilities**

Utility lines run in a network and require periodic upgrades in the project areas. Utilities that may be encountered during digging and trenching operations at the various flightline areas could include water, electrical, communications, stormwater and/or sanitary sewer systems, and fuel lines. Water mains are typically transite™ (i.e., asbestos cement) pipe. Utility service lines are galvanized steel or copper pipe. Sewer lines are cast iron under foundation slabs and within 5 feet of a building; outside the 5-foot line, sewer lines are vitrified clay pipes.

3.11 **Energy Conservation and Consumption**

The general policy of the Air Force regarding energy is: "Energy is essential to the Air Force's capability to maintain peacetime training, readiness, and credible deterrence; to provide quality of life; and to perform and sustain wartime operations. Energy is an integral part of the weapon system. The most fundamental Air Force energy policy goal is to assure energy support to the national security mission of the Air Force in a manner that emphasizes efficiency of use, effectiveness of costs, and independence from foreign sources for mission-essential operations" (AFFTC, 1995b).

Edwards AFB uses electricity, natural gas/propane, and other petroleum-based products (e.g., gasoline, jet fuel, and diesel) to operate facilities, vehicles, fueling equipment, and aircraft. Consistent with federal law and Air Force policy, Edwards AFB has developed various programs and methods to reduce energy use. These include energy awareness and education programs, which include standards for heating and cooling, and installation of energy management control systems for cooling, heating, and lighting. Utility meters and efficient fueling systems are being installed to heighten awareness of consumption. Other energy reduction projects at Edwards AFB include installation of ceiling and wall insulation, double-pane windows, building foyers, and energy-efficient lighting tubes. The use of solar energy is also being used whenever possible with the installation of photovoltaic cells throughout the base. In addition, construction of a solar farm to supplement current and future electrical energy needs has been proposed.

4.0 ENVIRONMENTAL CONSEQUENCES

This section addresses the impacts associated with the performance of routine flightline activities. It discusses the potential environmental consequences associated with Alternatives A and B. Changes to the natural and human environment that could result from the implementation of Alternative A were analyzed relative to the existing environmental conditions.

4.1 Land Use

Additional routine flightline activities would be compatible with building and flightline land use established in the Base General Plan and AFI criteria. Additionally, siting of new facilities or land use on adjacent property would require approval from the base Planning and Zoning Committee. Compliance with military construction codes, fire codes, and AFI guidelines would be accomplished; therefore, no significant adverse impacts to land use would be anticipated.

4.1.1 Alternative A Impacts (Proposed Action Alternative)

4.1.1.1 Airfield Operations

Any additional routine flightline activities would occur in areas adjacent to and on the flightline and at designated remote locations. All activities would be conducted IAW applicable airfield operations criteria and coordinated through Airfield Management. Consequently, no significant adverse impacts to airfield operations are anticipated.

4.1.1.2 Foreign Object Damage Control

Foreign object damage materials may end up on runways, taxiways, or aprons as a result of routine flightline activities. These materials could become airborne projectiles when caught up in the downwash of hovering helicopters or from exhaust plumes during aircraft takeoff and landing. Airborne debris could also be produced near exposed unstabilized ground surfaces such as cleared unpaved areas. The FOD materials could puncture tires, damage engines, or cause possible injury or death to airfield personnel. Continued implementation of standard operating procedures for FOD prevention would reduce the potential for impact. Therefore, no significant adverse impacts would be anticipated as a result of FOD.

4.1.1.3 Bird/Wildlife Aircraft Strike Hazard

Additional routine flightline operations could be affected by roosting and nesting birds in structures or vegetation along the flightlines. Conditions for BASH could impact flightline activities and flight operations. Continued implementation of standard practices to control roosting and nesting habitats would minimize the potential for BASH. Therefore, no significant adverse impacts would be anticipated as a result of BASH.

4.1.2 Alternative A Minimization Measures (Proposed Action Alternative)

The following minimization measures are recommended or required:

a. Comply with UFC 3-260-1, *Airfield and Heliport Planning and Design*;

b. New siting projects would be reviewed and approved by the base Planning and Zoning Committee to ensure consistency with base plans;

c. The proponent/contractor shall contact Airfield Management for FOD materials reduction guidelines and all project personnel shall use standard operating procedures for the prevention of FOD;

d. To avoid mission-related conflicts, some routine flightline activities require 10 to 14 days advance notice to Airfield Management for activity within flightline boundaries. The proponent/contractor shall contact Airfield Management for coordination requirements;

e. Projects requiring soil excavation may need to have soil stabilized in order to prevent FOD. Contact Airfield Management for recommendations on preferred methods of soil stabilization; and

f. The proponent/contractor shall adhere to the *AFFTC Bird/Wildlife Air Strike Hazard Management (BASH) Plan 91-202* (AFFTC, 2003a) and Air Force Pamphlet 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques* (2004).

4.1.3 Alternative B Impacts (No Action Alternative)

Under this alternative, routine flightline activities would occur within the current preapproved footprint of existing flightline areas. The potential for BASH and FOD incidents would be less than those discussed under Alternative A. No significant adverse impact is anticipated with continued implementation of standard practices and policies.

4.1.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be the same as those listed for Alternative A.

4.2 Air Quality

4.2.1 Alternative A Impacts (Proposed Action Alternative)

Implementing the proposed action would impact air quality by producing a variety of air emissions from various sources. A short-term degradation in air quality would be experienced during maintenance and operational activities. Sources of emissions generated under the proposed action include emissions from: aircraft and UAS engine run-ups; TSE (includes

equipment, usually painted 'Air Force green,' that is part of a unit or squadron that remains with that unit and may be deployed anywhere in the world); and AGE (includes all powered equipment greater than 50 horsepower, except refueling trucks, used in the maintenance and/or support of incoming and outgoing aircraft). The AGE includes equipment directly supporting aircraft systems such as ground power units, starter units, air conditioners, heaters, or hydraulic units, and equipment for indirect support such as lighting units (AFFTC, 1995a).

Fugitive dust emissions (PM_{10} and $PM_{2.5}$) would be generated by activities such as fabrication, grading projects, and off-road driving.

Hazardous air pollutant (HAP) emissions generated from additional routine flightline activities could include, but are not limited to xylene, benzene, isopropyl alcohol, trichloroethene, hexane, or toluene. Some HAP emissions would be intermittent from occurrences such as accidental fuel spills. Compliance with all CAA Title III HAP requirements, or any more stringent state or local requirements as they apply to stationary sources that emit HAPs, would be required. The HAP potential-to-emit threshold values are 10 tons per year for a single HAP and 25 tons per year for any two or more HAPs. For Edwards AFB, the total HAP emissions were 4.683 and 5.561 tons in 2000 and 2001, respectively. Consequently, no significant adverse HAP-related impacts are expected during additional routine flightline activities.

Toxic air contaminant emissions regulated under *Air Toxics "Hot Spots" Information and Assessment Act* (AB 2588, 1987) would be generated as a result of additional operation and maintenance activities on the flightline, including the operation of portable and stationary combustion engines, storage tanks, diesel combustion engines, paint booths, welding, jet engine testing, and other flightline activities involving the use of solvents, cleaners, sealants, and adhesives. These toxic air contaminant emissions would require inclusion in the toxic emissions inventory report provided to the KCAPCD, MDAQMD, AVAQMD, or CARB by Edwards AFB.

Greenhouse gas emissions occur naturally in addition to fugitive emissions from sources that would include, but are not limited to: stationary (nontransport) internal combustion engine equipment, turbines, industrial processes, fuel storage facilities, or fueling/defueling operations; nonstationary (mobile) sources or ground aircraft operations; and exhaust from the tanker trucks and other internal combustion engine vehicles. In compliance with AB 32, Environmental Management is establishing procedures to monitor and inventory emission sources and calculate GHG emissions where appropriate.

Total air emissions from the proposed action from all sources (mobile and stationary) would be estimated on a project-specific basis. The amount of air emissions for any action categorically excluded under this EA would be independently calculated prior to execution to determine if emissions comply with federal, state, and local air quality standards. The concentrations are required to be *de minimis* under 40 CFR 51.853/93.153(b)(1) and below the eastern KCAPCD *de minimis* levels as determined by air emission calculations. The air emissions from base missions are less than 100 tons per year for all criteria pollutants for a maintenance facility (AFFTC, 2007). Thus, the proposed action would not be expected to have a regionally significant impact in the KCAPCD, MDAQMD, or AVAQMD.

The air conformity determination for this EA is based on emissions for the types of vehicles, activities and equipment currently, and projected to be used, during routine flightline activities. A copy of the *CAA* conformity letter can be found in Appendix F. The proposed action would comply with all applicable federal, state, and local laws and regulations. Compliance with the minimization measures listed in Section 4.2.2 of this EA would further reduce anticipated impacts due to criteria pollutant or ozone precursor pollutant air emissions.

Emissions from permitted devices and activities must be tracked and reported to the CARB, the appropriate air district, and the U.S. EPA. Some ground operations would require an air permit from one or more of the three air districts or would generate HAPs. Typical devices used in ground operations activities that require permits include the following:

a. Boilers, steam generators, emergency generators, emergency firewater pumps, diesel generators, dust collectors, or combustors;

b. Construction equipment;

c. Any engine tests;

d. Any engine tests at the Multiaxis Thrust Stand;

e. Engine test facilities (e.g., cells, stands, or hush houses);

f. Fuel storage/dispensing;

g. Painting operations (including vehicles and aircraft);

h. Degreasing operations;

i. Laboratory activities, research, and development;

j. Propellant mixing;

k. Abrasive blasting, grinding/milling, and sanding operations; and

l. Dust collection systems

4.2.2 **Alternative A Minimization Measures (Proposed Action Alternative)**

The following measures are required or recommended to minimize impacts to air quality.

a. Future project proponents should contact Environmental Management to determine if an Air Force Form 813 and subsequent analysis is required. A *CAA* Conformity Statement and/or air quality analysis would also be required and project-specific minimization measures would be determined at the time of the Air Force Form 813 submittal.

b. All routine flightline activities must comply with all *CAA* Title III HAP requirements, or any more stringent state or local requirements as they apply to stationary sources that emit HAPs.

c. All chemicals/materials procured for projects by any means other than the HAZMAT Pharmacy shall be reported to Environmental Management for inclusion in the base air emission report and HAZMAT inventory.

d. All routine flightline activities shall comply with all applicable local and state air pollution control district rules and regulations.

(1) Project activities shall comply with all applicable rules and regulations as identified in AFI 32-7040, *Air Quality Compliance and Resource Management* (2007).

(2) All paints, including specialty coatings, shall comply with VOC requirements.

(3) Air quality operational permits are required for all equipment powered by internal combustion engines equal to or greater than 50 brake horsepower.

(4) All project equipment shall use diesel fuel meeting CARB specifications including the 15 parts per million sulphur-content requirements. All mechanical equipment should be kept in good working order according to applicable technical orders and equipment maintenance manuals to reduce emissions to acceptable levels.

e. All earthwork activities should be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to accomplish the project should be minimized. Exposed surfaces should be periodically sprayed with water or soil binder. Use of soil binders should be coordinated with Environmental Management because some soils binders contain hazardous substances. Ground-disturbing activities should be delayed during high-wind conditions (over 25 miles per hour).

f. Visible emissions (e.g., dust or smoke) from the proposed projects shall not exceed the limitations as outlined by the local air district.

g. All vehicles transporting fill material or debris require a cover.

h. Projects shall not discharge from any source, whatsoever, such quantities of air contaminants or other material that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public; endanger the comfort, repose, health, or safety of any such persons; or cause, or have a natural tendency to cause, injury or damage to business or property.

i. Personnel working on refrigeration units, or equipment used to recover or service such units, must be certified by the U.S. EPA.

j. To comply with AB 32, *California Global Warming Solutions Act of 2006*, projects shall be coordinated with Environmental Management so that an inventory of possible GHG emission sources and assessments can be established.

k. Other minimization/mitigation measures that may be adopted would include improving operational practices and the energy efficiency of aircraft and combat vehicles.

4.2.3 **Alternative B Impacts (No Action Alternative)**

Air quality impact under this alternative would be similar to impacts discussed under Alternative A. Emissions sources would remain the same but occur less frequently; consequently, the total amount of emissions would be less compared to the proposed action. Air emissions, including GHG, would be calculated to determine compliance with base air quality standards.[1] No significant impact is anticipated with continued implementation of standard practices and policies.

[1]No GHG compliance requirements were in place at the time of printing.

4.2.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be similar to those discussed under Alternative A.

4.3 Water Resources

4.3.1 Alternative A Impacts (Proposed Action)

4.3.1.1 Stormwater Management

Additional routine flightline activities would involve ground-disturbing activities including, but not limited to, grading. These activities could potentially alter drainage patterns and affect stormwater runoff. Surface water runoff during rain showers has the potential to erode exposed soil and deposit the sediment into the stormwater sewage system. Excess sediment in the stormwater would affect stormwater management and requirements of the *Clean Water Act (CWA)* (33 U.S.C. 1251 et seq.). It is recommended that projects with ground-disturbing activities develop a site-specific SWPPP and implement the best management practices (BMP) within the plan. No significant adverse impacts to stormwater are expected.

4.3.1.2 Wastewater

Wastewater would be generated during additional flightline activities. Wastewater sources would include maintenance activities and wash racks. Wastewater from routine flightline operations and maintenance activities would be conveyed to the WWTP and must meet specific pretreatment standards. Additional routine activities would not be expected to significantly change existing wastewater volumes or quality.

4.3.2 Alternative A Minimization Measures (Proposed Actions)

The following measures are required to minimize impacts to water resources.

a. Per AFI 32-7041, *Water Quality Compliance*, construction activities involving grading, clearing, or excavating 1 or more acres would require an SWPPP. The plan shall include site-specific control measures and BMPs that would be implemented during construction in order to ensure that nonstormwater discharges are contained and prevented from entering the wastewater system.

b. An AFFTC IMT 5852, *Permit for Industrial Waste Water Discharge*, would be required in the event that postconstruction facility operations would include the potential for generation of industrial wastewater requiring proper disposal (e.g., use of HAZMAT in a building where restroom facilities are connected to one of the base WWTPs). The proponent/contractor shall be responsible for coordinating the permit.

c. Wastewater from maintenance shops must comply with AFFTCI 32-6, *Edwards AFB Wastewater Instruction*. This instruction establishes base policy and assigns responsibility for wastewater system oversight, operation, and monitoring and reporting requirements.

4.3.3 Alternative B Impacts (No Action Alternative)

The No Action alternative would have similar impacts to the impacts discussed under Alternative A; however, activities under this alternative would be conducted intermittently,

implementing water resource actions on an as-needed basis. No significant impact is anticipated to water resources, since BMPs would be in place to control sediment runoff at project sites and wastewater discharges.

4.3.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be similar to those discussed under Alternative A.

4.4 Safety and Occupational Health

4.4.1 Alternative A Impacts (Proposed Action)

4.4.1.1 Exposure Hazard

Additional maintenance and testing in controlled conditions and operational activities along the flightline would increase potential exposure to hazards. Exposure as a result of inhalation risk hazards, directed energy systems, chemical hazards, explosives and ordnance, and hazardous noise conditions would be possible. Because the DOD has implemented specific safety and occupational health guidelines and procedures, and conducts required safety training for all maintenance and flightline personnel, the likelihood that a significant impact resulting from additional routine flightline activities on any safety or occupational health area is highly unlikely to take place.

a. Directed Energy. Developmental test and evaluation, and research and development of variant laser and microwave systems are conducted at approved locations on base. The use of distinct wavelengths and frequencies emitting radiation energies can pose an exposure risk to personnel health. The possible effects to humans vary depending on dose, length of exposure, and type of effect. Eye exposure to light beams of some wavelengths could potentially cause scarring, vision clouding, and partial loss of sight. Nonbeam exposure hazards would include electrocution, fire, and collateral radiation.

b. Chemical Hazard. Asbestos dust particulates, friable ACMs, could be encountered during routine operations, and runway and aircraft maintenance (Czarnecki, 2008). Asbestos-containing material could be encountered during maintenance of flightline equipment.

(1) Actions involving maintenance could potentially expose personnel and the environment to lead-based, heavy-metal, and low-observable paints, and mercury. Lead is a cumulative poison that enters the body by ingestion, inhalation, or absorption through the skin. Digestive, optic, and nervous systems can be affected by lead. Lead is considered a threat to human health and the environment if uncontrolled or treated incorrectly. Heavy-metal paints including, but not limited to, mercury and chromium-based paints could be encountered during execution of routine flightline activities. Mercury is a skin, eye, and mucus membrane corrosive. High concentrations in the body act as a poison causing severe respiratory damage. Damage to the central nervous system could come as a result of chronic, long-term exposure. Certain chromate dusts are severe irritants to the nasopharynx, larynx, lungs, and skin. As such, chromium is considered a potential inhalation and ingestion hazard.

(2) If PCB-bearing equipment is moved or improperly serviced, there is a risk for exposure to commercial PCB. Polychlorinated biphenyl is a potential carcinogen and may cause liver damage.

(3) Activities in support of research, engineering, and developmental test and evaluation missions on the flightline have the potential to expose personnel to nanoscaled or nanostructure materials in applications such as coatings, structural material, filters, and electronics. Exposure routes for nanoscaled materials could include inhalation, dermal contact, and ingestion. Characterization of exposure risks for nanoscaled particles is incomplete at present; however, the adoption of BMPs and controls would ensure safer handling. Procedures for use and storage are outlined in Department of Defense Instruction (DODI) 6050.05, *DOD Hazard Communications (HAZCOM) Program*.

(4) The use of solvents or degreasers during engine parts and machine tool cleaning could present exposure health risk under poor ventilation conditions. The handling of jet fuels during fueling and defueling operations and fuel vapors from residual fuel during routine maintenance of aircraft and fuel lines could cause a possible flammable risk environment.

c. Explosives, Ordnance, and Propellants. Explosives, ordnance, and propellants would be stored and handled in support of developmental test and evaluation and avionics integration on test aircraft in specified areas subject to strict management practices. All aspects of explosives procedures are contained in AFJMAN 91-201, *Explosives Safety Standards*. Explosives transported from the munitions storage area by vehicles may pose a safety hazard to personnel handling and transporting these explosives if applicable safety and health regulations are not followed. If appropriate safety measures are not followed, handling and transporting explosives, ordnance, and propellants have the potential to be harmful to range personnel. Emergency response actions from Explosive Ordnance Disposal personnel would be necessary to render safe the conventional explosive ordnance, which includes detonation in-place and removal of such ordnance to a safer location.

d. Hazardous Noise. Hazardous noise would include exposure to ambient noise levels exceeding 85 decibels during developmental test and evaluation of aircraft engines and the operation of heavy equipment during maintenance activities. Noise from engine runups, heavy equipment, jet engines, and other missions on the flightline could potentially expose workers and other persons within and adjacent to the flightline areas to increased short-term noise levels. Noise can cause hearing loss, temporary and permanent; communication and sleep interference; inability to perform tasks; as well as possible stress reactions.

e. Environmental/Physical Hazards. Personnel working outdoors along the flightline could experience heat stress conditions during the summer months that would pose health and safety risks. Venomous snakes and poisonous insects could be encountered in abandoned structures and outdoor settings. Valley fever, an upper respiratory condition, has been reported in the Antelope Valley area and could potentially be found in dust particulates of soil disturbed during construction and grading activities. Conditions suited for hantaviruses could be present in areas where rodent population is highly concentrated and rodent droppings are present.

4.4.2 **Alternative A Minimization Measures (Proposed Action)**

The following measures are required or recommended to minimize impacts to personnel health and safety.

a. The proponent/contractor shall be responsible for implementing hearing protection measures for their employees. If federal employees are involved in work activities, AFOSH

regulations must be followed and Bioenvironmental Engineering shall be contacted for specific requirements.

b. Ensure all residual fuel is removed from pipelines and delivery systems prior to general maintenance in order to minimize exposure to fuel vapors and potential fire hazards. The use of proper personal protective equipment during project activities shall be coordinated with Bioenvironmental Engineering.

c. The proponent/contractor should consult with Civil Engineering and Bioenvironmental Engineering to determine any safety concerns and to use proper engineering controls regarding the potential for exposure to heavy-metal based paints.

d. The proponent/contractor shall contact Civil Engineering regarding the occurrence and possible abatement of ACMs, lead-based, and heavy-metal paints.

e. Prior to any ground-disturbing activities, an AFFTC IMT 5926, *Edwards Air Force Base Civil Engineering Work Clearance Request* (Digging Permit) shall be submitted and routed through Environmental Management.

f. During work outdoors, the proponent/contractor should be aware of possible encounters with venomous snakes and spiders and potential heat stress-related conditions during the summer months.

g. Project activities involving welding, torching, cutting, and brazing require an Air Force Form 592, *Welding, Cutting and Brazing Permit* (Hot Work Permit) from the base Fire Department.

4.4.3 Alternative B Impacts (No Action Alternative)

Implementing this alternative would have similar impacts to personnel health and safety as those discussed under Alternative A. No significant impact to personnel health and safety is anticipated.

4.4.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be similar to those discussed under Alternative A.

4.5 Hazardous Materials and Waste

4.5.1 Alternative A Impacts (Proposed Action Alternative)

4.5.1.1 Hazardous Materials

The use of HAZMAT could result in potential impacts to the environment, as well the health and safety of personnel, if materials are not properly handled. The type and quantity of material would determine the level of potential impact. Hazardous materials that would be used during additional maintenance and operation flightline activities include, but are not limited to: jet fuels, oils, deicing agents, compressed gases, solvents, engineered nanomaterials, paint thinners, sealants, fire retardants, paints, corrosives, PCBs, and pesticides. Compliance with all applicable standards and/or regulations addressing HAZMAT management, including utilizing designated

hazardous material accumulation points, is required and would ensure proper handling, use, and storage of these substances on base. No significant impact would be expected.

4.5.1.2 **Hazardous Waste**

The use of HAZMAT would result in the generation of hazardous waste (e.g., solvents, paint waste, or oily rags) that requires proper handling and disposal. Hazardous waste generated through additional routine flightline activities would be expected to be similar in type and nature to, but of a higher volume than, those presently generated. Compliance with all applicable standards, laws and/or regulations addressing hazardous waste management is required and would ensure proper handling, use, storage and disposal of hazardous waste generated on base.

The federal government regulates hazardous wastes through the *RCRA* and *CERCLA*, and their amendments; and implements federal regulations in Title 40 of the CFR. Compliance with these laws and regulations would reduce the potential for HAZMAT impacts to less than significant.

4.5.1.3 **Solid Waste**

Additional flightline activities under this alternative could generate varying quantities and types of solid waste including waste from maintenance and operation activities, and renovation projects. The Air Force's Pollution Prevention policy sets forth guidelines to reduce the solid wastestreams. Some waste generated from routine flightline activities could be recycled (e.g., concrete, plastics, or metals) or landfilled according to established procedures. Edwards AFB requires use of environmentally preferable products and services where possible. Environmentally preferable products and services are those which have a reduced impact on human health and the environment. Federal agencies are required to procure environmentally preferable products and services in support of markets for recycled materials and products containing recycled materials. Recycling and reusing appropriate materials would reduce the amount of solid waste discarded in landfills. No significant impact to off-base or the on-base solid waste management program would be expected.

4.5.2 **Alternative A Minimization Measures (Proposed Action Alternative)**

The following measures are required or recommended to minimize impacts due to the use of HAZMAT and the generation of hazardous waste and solid waste.

a. Electrical equipment and testing instruments may contain mercury and/or PCB materials. Fixtures ready for disposal would be subject to hazardous waste requirements. The proponent/ contractor shall coordinate disposal with Environmental Management.

b. All new electrical equipment procured for the project (e.g., switches and transformers) shall be specified to contain no detectable PCBs.

c. The proponent/contractor should ensure all HAZMAT are authorized and managed in compliance with applicable sections of EAFBI 32-119, *Edwards Air Force Base Hazardous Material Management Process,* which is applicable to all organizations on Edwards AFB, including tenants and contractors.

d. Hazardous wastes are subject to land disposal restriction requirements. Signed hazardous waste disposal manifests would be required for all hazardous waste that generate ACMs; lead-, mercury-, chromium-, or other heavy metal-based paints; and/or PCB-containing wastes prior to transportation to a U.S. EPA-approved landfill. The proponent/contractor shall submit all manifests for signature to the Environmental Management coordinator.

e. The proponent/contractor shall ensure that all hazardous waste management practices comply with all applicable sections of AFI 32-7042, *Waste Management* (2009), and the Edwards AFB HWMP (95 ABW, 2005a).

f. The disposal of solid waste shall be coordinated with the Environmental Management, Solid Waste Program manager to determine disposition of the wastestream. Some of the solid waste may be recycled, reused, or transported to a state-licensed landfill.

g. The base Director of Safety shall be notified at least 48 hours prior to off-loading HAZMAT.

h. Any hazardous waste generated shall be handled IAW applicable regulations: 49 CFR 171–177, *Waste Transportation and Packaging;* 40 CFR 260–299, *Storage, Treatment, and Disposal of Waste;* AFI 32-7042, *Waste Management* (2009); and the Edwards AFB HWMP (95 ABW, 2005a).

i. In accordance with AFI 32-7042, *Waste Management*, a hazardous waste initial accumulation point and its proposed location must be approved by and coordinated with Environmental Management.

j. Hazardous wastes are subject to land disposal restriction requirements. Signed hazardous waste disposal manifests shall be required for all hazardous wastes prior to transportation for off-base disposal to an approved landfill.

k. The proponent/contractor shall submit all hazardous waste manifests to the Environmental Management Compliance Branch manager.

4.5.3 **Alternative B Impacts (No Action Alternative)**

Implementing this alternative would have similar impacts to the wastestream as those discussed under Alternative A. No significant impact is anticipated, since procedures to control the use of HAZMAT and the generation of wastestreams would be in place.

4.5.4 **Alternative B Minimization Measures (No Action Alternative)**

Minimization measures would be similar to those discussed under Alternative A.

4.6 **Biological Resources**

4.6.1 **Alternative A Impacts (Proposed Action Alternative)**

Of the several species of interest, there is only one federally listed yearround species on Edwards AFB, the desert tortoise (*Gopherus agassizii*), with legally required mandates on management practices. It is federally listed as threatened under the ESA and state listed as threatened by the California Fish and Game Commission. Aspects of the proposed action at Main Base, North Base, and South Base flightline areas are located within or adjacent to habitat

of the desert tortoise. Additional ground-disturbing activities at borrow site areas may indirectly disturb desert tortoise habitat or otherwise create conditions that are adverse to the species' success. Mitigation requirements regarding the desert tortoise and use of borrow pits are outlined in the *Biological Opinion for the Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (Appendix E). Ground-disturbing activities at borrow site areas can also impact other sensitive burrowing species at borrow sites, and considerations for these species are detailed in the *Environmental Assessment for Borrow Sites at Edwards Air Force Base, California* (USACE and AFFTC, 1996). Additional routine flightline related activities would use existing runways, previously disturbed areas, and roadways, already approved for similar types of operations (AFFTC, 2007).

Additional ground-disturbing activities may impact nesting sites of ground-dwelling birds, such as burrowing owls. Burrowing owls are known to inhabit drainage pipes and other manmade structures as well as the burrows or dens of other animals. Support equipment would be operated from designated areas such as the aircraft hangars, aprons, dry lakebeds, existing roads, and previously disturbed areas on the flightline. Program personnel would continue to follow the guidelines promulgated by the 95 ABW and 412th Test Wing to ensure that impacts on natural resources are minimized and remain less than significant.

Excess surface water runoff during the rainy season periodically accumulates on the lakebeds as standing water. During these conditions, migratory birds may use the lakebed as a resting stop, increasing the potential for BASH and effects on possible flight operations. No significant impact is anticipated provided flight operations are coordinated with the Environmental Management Natural Resource specialist for recommended actions.

Flight operations or construction activities at remote locations would require coordination with the Environmental Management Natural Resource group. Prior coordination would ensure that biological resources in the area would be identified and sensitive habitats, such as the desert tortoise, could be avoided. In the Sopp Field area, desert tortoise relative densities are considered in the low range from 3 to 8 per square mile (Figure 16) (AFFTC, 1996b). No significant impact to the desert tortoise is anticipated in the Sopp Field area if coordination with Environmental Management is established.

4.6.2 **Alternative A Minimization Measures (Proposed Action Alternative)**

To minimize impacts to biological resources, additional routine flightline activities shall adhere to the terms and conditions of the applicable biological opinions in Appendix E.

The following are typical terms and conditions contained in various biological opinions, but are not necessarily all the requirements.

a. All project personnel shall complete a desert tortoise education program conducted by Environmental Management. Training shall be scheduled by contacting the Natural Resources coordinator at least 3 days before the start of the project to schedule the briefing.

b. A desert tortoise or migratory bird presurvey will be required prior to any project or construction activities. The presurvey will be scheduled by contacting the Natural Resources

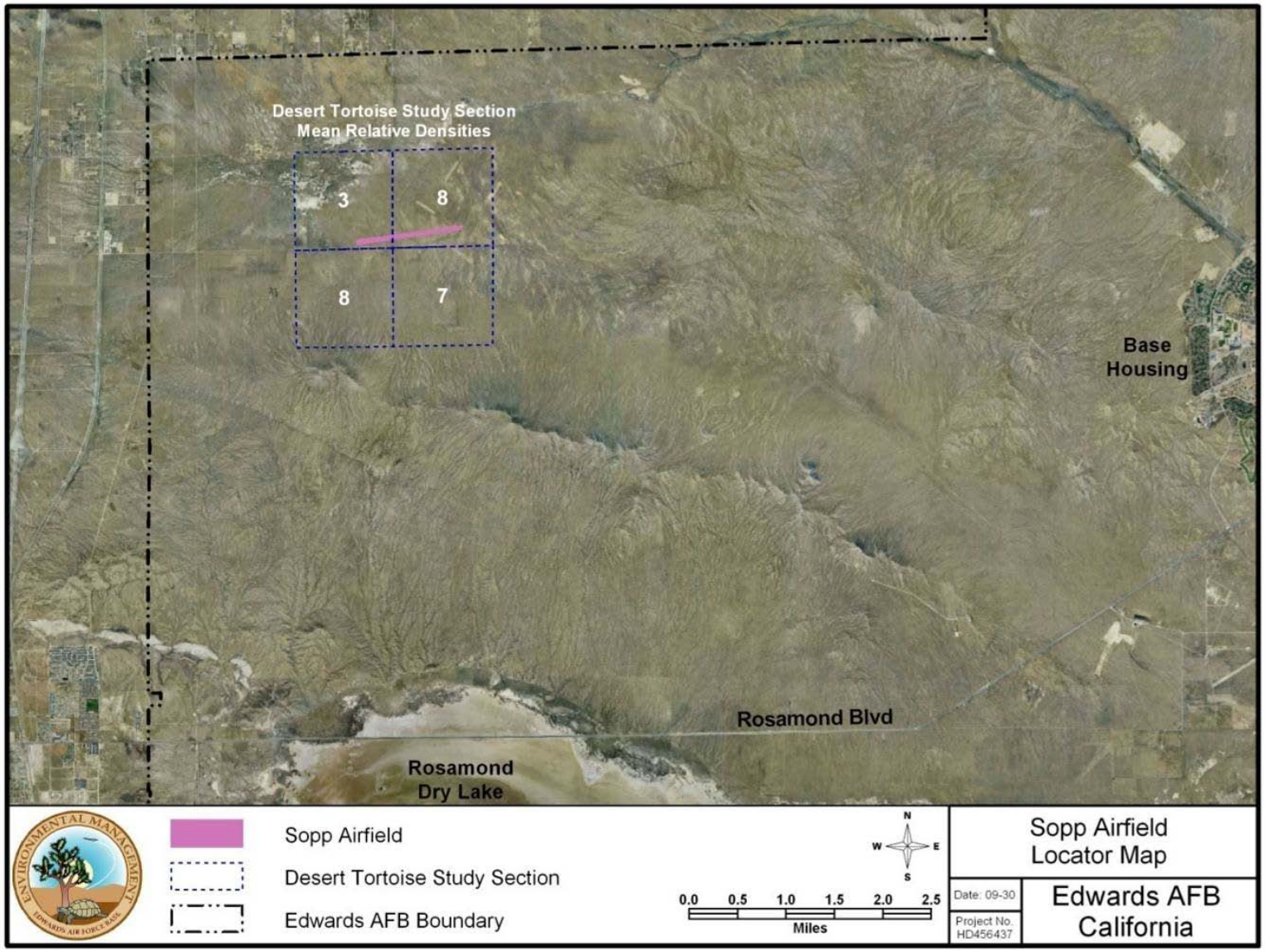


Figure 16. Sopp Airfield Desert Tortoise Relative Density

contractor at least 3 days before work begins. If project activities cannot be completed within 2 consecutive days, notify Natural Resources at least 3 days before work resumes for additional desert tortoise surveys.

c. All workers shall be instructed that their activities must be confined to locations within the project area and not stray beyond the work area.

d. Open excavations created during project activities shall be secured at the end of each day by backfilling, placing a cover over the excavation, installing temporary desert tortoise Environmental Management-approved fencing, and/or by creating a 3:1 slope at each end of the ditch.

e. Excavations left unsecured during the workday shall be checked three times per day (morning, midday, and late afternoon) for trapped animals. If any animals are found in an excavation, notify the Environmental Management Natural Resource coordinator immediately.

f. Project personnel shall remain on existing roads and use previously disturbed areas to store and stage equipment and materials. Speed limits on dirt roads within the project area shall be less than 20 miles per hour.

g. All project personnel working in open areas shall inspect under all vehicles and equipment for desert tortoises prior to operation. If a tortoise is present, the vehicle shall not be moved and the Environmental Management Natural Resource coordinator shall be notified.

h. If desert tortoises are found within the project site or in open areas adjacent to the flightline and cannot be avoided, consultation with United States Fish and Wildlife Service may need to be accomplished. Coordinate findings with the Environmental Management Natural Resources coordinator.

i. Active bird nests and bat roosts could be encountered. Contact the Environmental Management Natural Resources personnel to remove both the nesting birds and roosting bats.

j. All trash will be kept in raven-proof containers and disposed of each day.

k. Lakebed activities will be restricted to dry periods when the clay substrate is completely dry (i.e., no noticeable moisture in the soil).

l. Access to the lakebeds shall occur from roads that provide direct access to the lakebeds.

m. A migratory bird depredation permit would be required prior to the removal of any migratory bird, nest, or young from an area for flight safety.

n. Revegetation/restoration may be required based on the level of disturbance created from project activities. Revegetation/restoration shall be in accordance with the *Edwards Air Force Base Revegetation Plan* (AFFTC, 1994a). Please coordinate with Environmental Management Conservation Division for additional information.

o. Desert tortoises and their burrows shall be avoided. Desert tortoises cannot be moved from the project site or access routes. If a desert tortoise is discovered within the project site, work that would likely result in a take (e.g., death, injury, or harassment) of desert tortoise shall immediately cease. Desert tortoises interfering with the project must be allowed to continue on their way with no encouragement or discouragement from project personnel. Any sightings of desert tortoise in the area must be reported immediately to the monitoring biologist or Environmental Management Customer Service Desk.

p. All project personnel shall immediately report sightings of desert tortoises or desert tortoise burrows found within the project area to Environmental Management Conservation Division.

q. Contact Environmental Management Conservation Division if bats are observed roosting in the project area.

r. Contact Environmental Management Conservation Division at least 3 days prior to ground disturbance for assistance in developing measures to avoid adverse impacts to sensitive plant species.

s. This project would remove shrubs and/or Joshua trees. The proponent/contractor shall be required to replant shrubs/trees in accordance with Functional Area Staff Technical Division policies. Contact the 95 ABW Civil Engineer and Transportation Directorate for requirements.

4.6.3 Alternative B Impacts (No Action Alternative)

Under Alternative B, effects to biological resources would be similar to effects discussed under Alternative A. No significant impacts to biological resources are anticipated when prior coordination with the Environmental Management Natural Resource coordinator, to identify sensitive sites, is completed.

4.6.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be similar to those discussed under Alternative A.

4.7 Cultural Resources

4.7.1 Alternative A Impacts (Proposed Action Alternative)

Implementation of the Proposed Action Alternative would be conducted primarily in areas previously surveyed for cultural resources. Flightline activities in remote locations would require prior consultation with the Environmental Management Cultural Resources group to ensure sensitive cultural sites in the area are identified and not disturbed. No significant impact to cultural resources is anticipated if appropriate mitigation/minimization and coordination measures for cultural resources are completed prior to and/or during the execution of additional routine flightline activities.

4.7.2 Alternative A Minimization Measures (Proposed Action Alternative)

The following measures are required to minimize any potential impact to cultural resources in the area.

a. Early in the planning process, the proponent/contractor shall coordinate project activities with the Base Historic Preservation Officer to identify sensitive cultural resources and information is conveyed to field personnel.

b. If artifacts or bones are discovered during project activities, the project activities shall cease immediately and the project foreman shall immediately contact Environmental Management.

c. The proponent/contractor shall ensure all field workers complete a cultural resources awareness education program before commencing fieldwork. Environmental Management shall be notified at least 3 days prior to starting work to arrange for an awareness briefing. If additional personnel are brought onto the project after the initial briefing, then the proponent/contractor must contact Environmental Management for the new personnel to receive a cultural resources briefing prior to working on the project.

4.7.3 **Alternative B Impacts (No Action Alternative)**

The projects would be conducted incrementally on an as-needed basis within areas of the flightline and potential impacts would be similar to those under Alternative A.

4.7.4 **Alternative B Minimization Measures (No Action Alternative)**

Minimization measures would be similar to those discussed under Alternative A. No significant impacts are expected from implementation of the no action alternative if appropriate coordination and mitigation measures for cultural resources are completed or implemented prior to and during routine flightline activities.

4.8 **Geology and Soils**

4.8.1 **Alternative A Impacts (Proposed Action Alternative)**

No significant impacts are expected if appropriate coordination and mitigation measures for geology and soils are completed. The geologic faults in the area are dormant with no record of seismic activity or surface displacement in recent geologic history.

4.8.1.1 **Fill Material**

Fill material is a nonrenewable natural resource that is available at Edwards AFB. Much of the fill material for flightline use would be obtained from an approved on-base borrow site. Approved off-base sources may be used to meet specific soil-type requirements and/or to augment on-base resources. Implementing the Proposed Action Alternative would require fill material to infill possible excavations and for maintenance of lakebeds. Fill material would be obtained from approved borrow sites. Additional information regarding the fill material from borrow sites can be found in Section 4.6 of this document.

4.8.1.2 **Seismic Activity**

The northwest-southeast extension of the postulated Mirage Valley Fault is mapped through Main Base. The fault is seismically dormant with no record of earthquake activity or surface displacement. Seismic activity is occurring throughout the region with magnitudes of less than 4.0 on the Richter scale. These magnitude quakes produce little or no surface motion or structural damage to facilities. See Figure 13 for some of the local faults mapped in the Edwards AFB area. The use of building codes with seismic construction requirements would reduce the potential impacts if dormant faults become active.

4.8.1.3 **Environmental Restoration Program**

Environmental Restoration Program sites and areas of concern often undergo long-term monitoring and remediation efforts. These sites can be susceptible to damage from adjacent ground-disturbing activities. Numerous wells that consist of little more than short aboveground pipes may be positioned to sample groundwater, representing hours of work and precise locations. Valuable equipment that is calibrated and easily damaged may be left on site. The environment of a remediation or monitoring site is sensitive to disturbance because precise measurements may require controlled conditions. The data obtained is required to accomplish ERP goals and objectives.

Scattered throughout the area are former chemical storage and petroleum product spill sites. These sites were identified as areas of concern and have been investigated. Sites with surface contamination below action levels were designated sites with no further action and were closed with concurrence from regulatory agencies.

Active ERP sites could be encountered during the implementation of the Proposed Action Alternative. Many of the ERP sites are currently under remediation and confined to specific locations. Other ERP sites have completed remedial actions and have been designated closed and are no longer active. No significant impact is anticipated from the active ERP sites, since the sites are undergoing remediation, or the contaminated groundwater is at sufficient depth that the proposed action would not be affected.

4.8.2 **Alternative A Minimization Measures (Proposed Action Alternative)**

The following minimization measures are required or recommended.

a. All earthwork activities should be planned and conducted to minimize the generation of dust. The area of disturbance necessary to accomplish the project should be minimized as a dust-control measure. Ground-disturbing activities should be delayed during high-wind conditions (in excess of 25 miles per hour). Vehicular traffic, grading, and digging should not be permitted in the project area during high-wind conditions.

(1) Exposed surfaces should be periodically sprayed with water.

(2) Asphalt debris should be recycled and incorporated into fill material to reduce the dependency on existing resource materials.

b. Additional project activities may be located in close proximity to ERP monitoring wells and remediation equipment. Prior to onset of any ground-disturbing activity, the proponent/ contractor shall contact Environmental Management Restoration Branch for location of ERP equipment. Damage to ERP equipment must be avoided.

c. Prior to commencement of additional work activities at approved borrow sites, the proponent/contractor shall specifically establish approved locations, perimeters, and dimensions of the approved site. To establish these coordinates, the contractor shall consult with Environmental Management to identify specific environmental issues including, but not limited to, endangered, threatened, and sensitive species.

d. Design standards to be followed include: *Edwards Air Force Base Design Standards* (95 ABW, 2009a), UFC 3-310-04, *Seismic Design for Buildings*; Unified Facilities Guide

Specifications 13 48 00.00 10, *Seismic Protection for Mechanical Equipment; Uniform Building Code* Chapters 23, 26, 27, and 29 (International Conference of Building Officials, 1997) with the applicable California Supplements; and Kern County building codes.

e. Any digging to occur 12 or more inches below the ground surface would require a Digging Permit. The proponent/contractor shall coordinate the Digging Permit for specific requirements.

4.8.3 Alternative B Impacts (No Action Alternative)

Under this alternative, projects would be conducted incrementally on an as-needed basis. The impacts to geology, soils, and ERP sites would be similar to those discussed under Alternative A. No adverse environmental impacts are anticipated, since recognized borrow sites would be used and seismic activity along the geologic fault is dormant. In addition, no significant impact to active ERP sites is anticipated, because the sites are under remediation and contaminated groundwater is at sufficient depth.

4.8.3.1 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be the same as those discussed under Alternative A.

4.9 Infrastructure

4.9.1 Alternative A Impacts (Proposed Action Alternative)

4.9.1.1 Transportation

Some activities under the proposed action have the potential to affect the transportation system through traffic delays or the temporary closure of roadways. Traffic delays would be temporary and short-term. Early coordination with base organizations would ensure that necessary safety precautions are taken, and would allow ample advance notice to affected commuters and personnel. No significant impact to transportation is anticipated, with early coordination with appropriate base organizations to ensure necessary traffic management and safety precautions are taken.

4.9.1.2 Utilities and Communication Systems

Additional routine flightline activities have the potential to impact existing utility lines, such as water, sewer, electrical, or natural gas, through accidental penetration. This could result in temporary service interruption and the repair and replacement of the severed utility line. The location of these lines has been plotted on maps and is on file at Civil Engineering and the Communications Squadron. No significant utility-related impacts would be expected with proper coordination.

4.9.2 Alternative A Minimization Measures (Proposed Action Alternative)

The following minimization measures are required for the Proposed Action.

a. All work that causes closure, rerouting, or modification of roadways or streets shall be coordinated 15 days in advance with the Security Forces, base Fire Department, and Public Affairs Office. A current copy of the *California Manual of Traffic Controls for Construction*

and Maintenance Work Zones (California Department of Transportation, 2006) shall be used as guidance for traffic signs.

b. The proponent/contractor shall be responsible for obtaining and routing the Digging Permit. Contact the base Civil Engineer Infrastructure Controller for coordination.

c. Some utilities require a representative be present on site at all times when motorized construction equipment is being used within 20 feet from existing lines. The project sponsor shall coordinate with Civil Engineering in order to identify the location of affected lines.

d. If current as-built drawings indicate existing utility lines are not available, no mechanical digging can be performed within 4 feet of utilities or communication cables until they are physically exposed by hand digging.

4.9.3 Alternative B Impacts (No Action Alternative)

The impacts to the infrastructure would be similar to those discussed under Alternative A. No significant impact to utility and communication systems is anticipated when coordinated with Airfield Management, Civil Engineering, and the Communications Squadron.

4.9.4 Alternative B Minimization Measures (No Action Alternative)

Minimization measures would be similar to those discussed under Alternative A.

4.10 Energy Conservation

4.10.1 Alternative A Impacts (Proposed Action Alternative)

Newly installed equipment would incorporate technologies designed to economize on energy use and to improve operational efficiency. These measures could result in a substantial cost savings to the Air Force. Use of these measures would contribute to the Air Force's achievement of energy-reduction goals as required by PL 109-58, *Energy Policy Act of 2005*, and Executive Order 13123, *Greening the Government through Efficient Energy Management*. A favorable impact toward energy conservation is anticipated when system upgrades are installed.

4.10.2 Alternative A Minimization Measures (Proposed Action Alternative)

No specific measures are required. It is recommended that the best available energy conservation measures be incorporated in upgrades and installation of equipment along the flightline.

4.10.3 Alternative B Impacts (No Action Alternative)

Energy conservation could be negatively impacted under the no action alternative because energy conserving upgrades would not be made. No significant impact is expected.

4.10.4 Alternative B Minimization Measures (No Action Alternative)

No specific measures are required. It is recommended that the best available energy conservation measures be incorporated as part of continuing activities.

4.11 *NEPA* Mandated Analysis

Additional environmental analyses are made to further determine potential impacts that may result if the Proposed Action Alternative is implemented. These analyses are based on determining the cumulative effects, unavoidable adverse effects, short-term uses versus long-term productivity of the environment, and the irreversible and irretrievable commitments of resources.

4.11.1 Cumulative Effects

Council on Environmental Quality regulations implementing *NEPA* requires agencies to consider the potential for cumulative impacts of proposed actions. 'Cumulative impact' is defined in 40 CFR 1508.7 as, "the impact on the environment, which results from the incremental impact of the action when added to other past, present (e.g., daily maintenance projects basewide, noise and air emissions from flights, and destruction of habitat), and reasonably foreseeable future actions (e.g., planned main runway overhaul and test mission beddowns)." Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

New flight test evaluation missions would require additional facilities, which could include military construction projects in adjacent properties and remote locations, renovation of existing hangars, and/or use of back shops. Additionally, installing materiel depot maintenance could require renovation of existing facilities or construction of new facilities. As part of the planning process for Edwards AFB, a General Plan (95 ABW, 2009c) has been established and specific areas designated as flightline property. It incorporates planning and design guidelines to ensure compatibility of all future development with existing facilities. It also coordinates the overall planning and design concepts for the flightline areas of the base.

The following cumulative impacts would be anticipated as a result of implementing Alternative A.

a. Air Quality. New developmental testing and evaluation, and operations and maintenance activities in conjunction with foreseeable projects, could incrementally contribute to air emissions. Increase in personal vehicle traffic from mission support personnel would result in added air emissions. Any emission changes due to increased routine flightline activities would be accounted for in Edwards AFB's emissions growth budget and allowance, and included in the normal operational commitment for the Air Force Flight Test Center. Foreseeable projects have been shown to be *de minimis*, consequently, no significant adverse cumulative impacts would be expected.[2]

b. Socioeconomic. There would be a potential positive cumulative impact from the implementation of Alternative A in conjunction with foreseeable projects. Increases in military and contract mission support personnel for new flight test missions and supporting military construction projects would result in gradual increases in workforce population followed by a drawdown in workforce at the end of the testing cycle. The estimated daily workforce of the base is 11,111 (AFFTC, 2007). New support personnel would be expected to represent a small percentage of the overall base population. Demands on regional utilities, to provide sanitary

[2]Cumulative effects to global climate change could occur as a result of additional routine activities. Emissions of greenhouse gases (GHG) including carbon dioxide could be expected from combustion activities. No significant cumulative impact to GHG would be anticipated because the percentage of GHG expected to be emitted from additional routine flightline activities would be minute in comparison to GHG emitted globally.

services, solid and hazardous waste services, electrical demand, natural gas supply, telephone and other communication services to support expanded flightline missions, would be well within existing capabilities for the area. Long-term impacts to these resources through the implementation of the Proposed Action Alternative would be minimal.

c. Geology and Soils. Proposed additional flightline activities would be conducted in designated areas of the base that have already affected the topography and soil conditions. Additional routine flightline activities are not expected to have a cumulative impact that would alter or change the topography or soil conditions in these areas. Additional routine flightline activities in adjacent properties or in remote locations may initially affect the topography or soil conditions, but the cumulative impact of additional flightline activities would not alter or change the physical settings. The effects of flightline activities are not expected to alter or change the physical geology in the area, and are not expected to be affected by the cumulative impact of additional flightline activities. No significant cumulative impacts to geology, topography, or soils would result from the proposed project activities.

Under Alternative B, the No Action Alternative, the cumulative effect on environmental resources would be similar to the impacts discussed under the Proposed Action Alternative, and the same as discussed in the 1997 Programmatic EA. The No Action Alternative would result in no change to the existing conditions as discussed in the 1997 Programmatic EA, accordingly no significant impacts would be expected. The activities currently occurring on the flightlines would remain relatively unchanged. This impact would occur whether or not the Proposed Action Alternative is implemented.

4.11.2 **Unavoidable Adverse Effects**

Unavoidable adverse effects are those that would occur regardless of mitigation, including those that are negative, occurring regardless of any identified minimization measures.

a. Air Quality. Pollutant emissions from flightline activities are unavoidable. However, degradation will be short term.

b. Safety and Occupational Health. Noise levels would increase as a byproduct of increased test missions and ensuing support activities being conducted, but would primarily occur during normal work hours and for short durations.

c. Increased FOD. Operational activities along the flightline would contribute unavoidable FOD concerns, potentially affecting aircraft operations.

d. Hazardous Materials. Exposure to dangers from the handling, use, and transportation of HAZMAT would be unavoidable.

e. Solid and Hazardous Waste. Generation of solid and hazardous waste is unavoidable. However, hazard and quantity increases would be minimal and would not be expected to exceed hazardous waste disposal capacities.

Unavoidable adverse effects associated with the No Action Alternative are anticipated to be similar to the Proposed Action Alternative.

4.11.3 **Short-Term Uses versus Long-Term Productivity of the Environment**

This section discusses the proposed project's short-term use of man's environment and the maintenance and enhancement of long-term productivity. Short-term uses, and their effects, are those activities that would occur during additional routine flightline activities. Long-term productivity looks at economic, social, and planning objectives and sustainability.

a. Effects of short-term use that would occur during additional flightline activities include:

(1) Noise hazards from heavy equipment use and aircraft testing;

(2) Hazardous material use and generation of hazardous waste;

(3) Minor disruptions in vehicular traffic due to the movement of equipment and workers;

(4) Possible disturbance to biological resources and their habitat;

(5) Potential to damage monitoring wells, lines, and/or remediation systems and infrastructure; and

(6) Increase in workforce and expenditure of funds to the local economy.

b. Additional routine flightline activities would have the following effects on long-term productivity:

(1) The addition of maintenance-depot level functions would attract workers to Edwards AFB affecting the local economy thus providing an economic benefit;

(2) The Air Force would save on energy resources with the use of newer more energy-efficient systems; and

(3) New and modernized facilities would allow additional updated developmental test and evaluation, research, and development missions. Flightline activities would continue and adapt to incoming developmental test and evaluation, research, and developmental flight test missions. Operation and maintenance projects are estimated between $5 million and $30 million. Costs would vary with mission requirements and location on the flightline and adjacent properties.

4.11.4 **Irreversible and Irretrievable Commitments of Resources**

Irreversible commitment of resources entails the consumption of, or adverse effect upon, resources that cannot be reversed or persists for an extremely long period of time. Irretrievable commitment of resources entails resources that are consumed or affected for a short period of time, which would be restored over time. Irreversible and irretrievable commitment of resources would result from routine flightline activities. Short-term commitments include labor, capital, and fossil fuels. Long-term commitments of resources would result directly from operation and maintenance of new facilities from the provision of water, sewage, electricity, solid waste, energy consumption in the form of fuels, and hazardous waste services.

Under the No Action Alternative B, the commitment of resources would be similar to those discussed under Alternative A.

5.0 **REFERENCES/BIBLIOGRAPHY**

95th Air Base Wing (95 ABW), 2004a, *Environmental Assessment for the Repair, Reconstruction, and/or Replacement of the Main Base Runway, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards Air Force Base (AFB), California.

95 ABW, 2004b, *Integrated Natural Resources Management Plan for Edwards Air Force Base, California, Edwards AFB Plan 32-7064*. Document on file at Edwards AFB, California.

95 ABW, 2005a, *Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042*. Document on file at Environmental Management, Edwards AFB, California.

95 ABW, 2005b, *Integrated Cultural Resources Management Plan for Edward AFB, California, Edwards AFB Plan 32-7065*. September.

95 ABW, 2006a, *Environmental Assessment to Modernize Storage Facilities in the Munitions Complex and throughout Edwards Air Force Base, California*, June. Document on file at Environmental Management, Edwards AFB, California.

95 ABW, 2006b, *Update to the Environmental Assessment to Modernize Storage Facilities in the Munitions Complex and throughout Edwards Air Force Base, California*, September. Document on file at Environmental Management, Edwards AFB, California.

95 ABW, 2007, *Integrated Natural Resources Management Plan for Edwards Air Force Base, California, Edwards Air Force Base Plan 32-7064*. Document on file at 95 ABW/EM, Edwards AFB, California.

95 ABW, 2008, *Routine and Recurring Small Transient and New Test Missions Environmental Assessment*, April. Document on file at Environmental Management, Edwards AFB, California.

95 ABW, 2009a, *Edwards Air Force Base Design Standards*, January.

95 ABW, 2009b, *Environmental Assessment for the Maintenance, Upgrade, and Construction of the Jet Fuel Distribution System Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

95 ABW, 2009c, *General Plan, Edwards Air Force Base, California*, January.

Air Force Flight Test Center (AFFTC), 1993, *Air Force Flight Test Center Oil and Hazardous Substance Spill Prevention and Response Plan*, 30 June. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1994a, *Edwards Air Force Base Revegetation Plan*, December. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1994b, *F-22 Combined Test Force Beddown Environmental Assessment, Edwards Air Force Base, California.* Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1994c, *Programmatic Environmental Assessment for Road Repair Projects*, September. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1995a, *Clean Air Act Conformity Analysis*, Edwards AFB, California, November. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1995b, *Edwards Air Force Base Energy Plan*, March. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1995c, *Environmental Assessment for South Base Runway Rehabilitation Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1996a, *Environmental Assessment for Borrow Sites at Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1996b, *Relative Density Estimates of Desert Tortoise on Edwards Air Force Base*, California, August. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1997a, *Programmatic Environmental Assessment for Routine Flightline Activities, Edwards Air Force Base, California*, March. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1997b, *Programmatic Environmental Assessment for the Basewide Removal, Replacement, and Installation of Oil/Water Separators, Edwards Air Force Base, California*, January. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1998a, *Environmental Assessment for the Continued Use of the Restricted Area R-2515, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 1998b, *Environmental Assessment for Semi-Prepared Airfield Construction, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2000, *Municipal Solid Waste Management Plan (MSWMP) for AFFTC/EMCP (AFFTC/ Environmental Management Directorate, Environmental Quality Division, Pollution Prevention Branch), Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2001a, *Environmental Assessment for Runway Rehabilitation of Main Base Runway, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2001b, *Programmatic Environmental Assessment for Ground Operations at Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2002, *Storm Water Pollution Prevention Plan, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2003a, *AFFTC Bird Aircraft Strike Hazard (BASH) Plan 91-202*, January.

AFFTC, 2003b, *Environmental Assessment for the Renovation and Construction of a Modern Flight Test Complex, Edwards Air Force Base, California*, July. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2004a, *Environmental Assessment for the Repair, Reconstruction, and/or Replacement of the Main Base Runway, Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2004b, *Integrated Natural Resources Management Plan for Edwards Air Force Base, California, AFFTC Plan 32-7064*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2005, *Integrated Cultural Resources Management Plan for Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2006a, *Environmental Assessment to Modernize Storage Facilities in the Munitions Complex and throughout Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2006b, *Environmental Assessment for Routine and Recurring Unmanned Aerial Vehicle Flight Operations at Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2006c, *Environmental Assessment for the Testing and Evaluation Directed Energy System Using Laser Technology at Edwards Air Force Base*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2006c, *Update to the Environmental Assessment to Modernize Storage Facilities in the Munitions Complex and throughout Edwards Air Force Base, California*. Document on file at Environmental Management, Edwards AFB, California.

AFFTC, 2007, *Air Force Flight Test Center Summary*. Acquisition and Cost Division, Edwards Air Force Base, California. Document on file at Environmental Management, Edwards AFB, California.

Air Force Flight Test Center Information Management Tool (AFFTC IMT)
AFFTC IMT 5852, *Permit for Industrial Wastewater Discharge, Edwards AFB, California*.
AFFTC IMT 5926, *Edwards Air Force Base Civil Engineering Work Clearance Request* (Digging Permit).

Air Force Flight Test Center Instructions (AFFTCI)
AFFTCI 10-2, 2005, *Control of Vehicles on the Airfield*, 2 May.
AFFTCI 11-1, 2004, *Aircrew Operations*, 14 January.
AFFTCI 11-2, 2004, *Ground Operations*, 10 August.
AFFTCI 11-15, 2005, *Scheduling Procedures for Aircraft and Air/Ground Support*, 29 November.
AFFTCI 21-5, 2004, *Foreign Object Damage (FOD) Prevention Program*, 16 July.

AFFTCI 23-1, 1995, *Hazardous Material Management Program*, 20 July.
AFFTCI 32-6, 1995, *Edwards AFB Wastewater Instruction*, 1 December.

Air Force (AF) Forms
AF Form 500, *Daily and Weekly Fuel Report*.
AF Form 592, *USAF Welding, Cutting and Brazing Permit*.
AF Form 813, *Request for Environmental Impact Analysis*.

Air Force Instructions (AFI)
AFI 21-101, 2006, *Aircraft and Equipment Maintenance Management*, 29 June; and AFMC Supplement 1, 2007.
AFI 23-201, 2004, *Fuels Management*, 7 July.
AFI 23-204, 1994, *Organizational Fuel Tanks*, 27 April.
AFI 32-1023(I), *Planning and Design of Airfields*.
AFI 32-7040, 2007, *Air Quality Compliance and Resource Management*, 27 August.
AFI 32-7041, 2003, *Water Quality Compliance*, 10 December.
AFI 32-7042, 2009, *Waste Management*, 21 April.
AFI 32-7044, 2003, *Storage Tank Compliance*, 13 November.
AFI 32-7061, 2003, *The Environmental Impact Analysis Process*, 12 March.
AFI 32-7062, 1997, *Air Force Comprehensive Planning*, 1 October.
AFI 32-7063, 2005, *Air Installation Compatible Use Zone Program*, 13 September.
AFI 32-7064, 2004, *Integrated Natural Resources Management*, 17 September.
AFI 32-7065, 2004, *Cultural Resources Management*, 1 June.
AFI 32-7080, 1994, *Pollution Prevention Program*, 12 May.
AFI 32-7086, 2004, *Hazardous Materials Management*, 1 November; and AFMC Supplement, 10 April 2006.
AFI 91-202, 1998, *The U.S. Air Force Mishap Prevention Program*, 1 August; AFFTC Supplement 1, 11 December 2002.
AFI 91-301, 1996, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, 1 June; and AFMC Supplement, 1 January 1997.
AFI 91-302, 1994, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Standards*, 18 April.

Air Force Joint Manuals (AFJMAN)
AFJMAN 24-306, 1993, *Manual for the Wheeled Vehicle Driver*, 27 August.
AFJMAN 32-1031(I), 1997, *Airfield and Heliport Planning and Design*, 1 May.
AFJMAN 91-201, 2001, *Explosives Safety Standards*, 18 October.

Air Force Occupational Safety, Fire Protection, and Environmental Health Standards (AFOSH STD)
AFOSH STD 48-9, 1997, *Radio Frequency Radiation (RFR) Safety Program*, 1 August.
AFOSH STD 48-19, 1994, *Hazardous Noise Program*, 1 March.
AFOSH STD 48-20, 2006, *Occupational Noise and Hearing Conservation Program*, 30 June.
AFOSH STD 48-21, 1993, *Hazard Communications*, 1 October.
AFOSH STD 48-139, 1999, *Laser Radiation Protection Program*, 10 December.
AFOSH STD 91-501, 2004, *Air Force Consolidated Occupational Safety Standard*, 7 July; and AFMC Supplement 1, 9 June 2006.

Air Force Pamphlet 91-212, 2004, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*, 1 February.

Air Force Policy Directives (AFPD)
AFPD 23-1, 2006, *Materiel Management Policy and Procedures*, 10 March.
AFPD 32-70, 1994, *Environmental Quality*, 20 July.
AFPD 90-8, 2004, *Environment, Safety, and Occupational Health*, 1 September.
AFPD 90-9, 2000, *Operational Risk Management*, 1 April.
AFPD 91-2, 1993, *Safety Programs*, 28 September.
AFPD 91-3, 1993, *Occupational Safety and Health*, 27 September.

Anderson, M., 2007, 95 ABW Civil Engineer and Transportation Directorate, Surfaces Office, personal communication regarding fill material, 30 January.

Antelope Valley Air Quality Monitoring District (AVAQMD) Rule 1901, 1994, *General Conformity*, 9 September.

Assembly Bill (AB) 32, 2006, *California Global Warming Solutions Act of 2006*, 31 August.

AB 2588, 1987, *Air Toxics "Hot Spots" Information and Assessment Act*, September.

California Air Resources Board (CARB), 1994, *California State Implementation Plan*, Volume I.

CARB, 2008, *Antelope Valley AQMD* [Air Quality Management District] *List of Current Rules*. http://www.arb.ca.gov/drdb/av/cur.htm, accessed in February 2008.

California Code of Regulations (CCR)
17 CCR 70200, *Designation Criteria and Area Designations for State Ambient Air Quality Standards, Table of Standards*.
22 CCR Division 4.5, *Environmental Health Standards for the Management of Hazardous Waste*.
22 CCR, Division 4.5, Chapters 10–20, regarding *Hazardous Waste Management System*.
22 CCR Division 4.5, Chapter 13, *Standards Applicable to Transporters of Hazardous Waste*.

California Department of Transportation, 2006, *California Manual of Traffic Controls for Construction and Maintenance Work Zones*.

California Fish and Game Code Section 2050 et seq., *California Endangered Species Act (CESA).*

California Government Code Section 51010–51019, *The Elder California Pipeline Safety Act of 1981*.

California Health and Safety Code (H&SC)
H&SC, Statutes of 1988, Chapter 1568, *California Clean Air Act*.
H&SC, Division 20, Chapter 6.5, *Hazardous Waste Control*.
H&SC, Division 20, Chapter 6.8, *Hazardous Substance Account*.

California Public Resources Code Section 2621–2630, *Alquist-Priolo Earthquake Fault Zoning Act*.

California Water Code, Division 7, *Water Quality*.

Code of Federal Regulations (CFR)
29 CFR 1910.95, *Occupational Noise Exposure*.
29 CFR 1910.1025, *Lead*.
29 CFR 1910.1200, *Hazard Communication*.
29 CFR 1926.1101, *Asbestos*.
32 CFR 989, *Environmental Impact Analysis Process (EIAP)*.
36 CFR 800, *Protection of Historic Properties*.
40 CFR 51.853, *Air Quality: Revision to Definition of Volatile Organic Compounds—Exclusion of Compounds, Air Conformity Applicability*.
40 CFR 61, *National Emission Standards for Hazardous Air Pollutants*.
40 CFR 93.153, *Environmental Protection, Applicability*.
40 CFR 112, *Oil Pollution Prevention.*
40 CFR 260–299, regarding Storage, Treatment, and Disposal of Waste.
40 CFR 300, *National Oil and Hazardous Substances Pollution Contingency Plan*.
40 CFR 1500–1508, regarding the National Environmental Policy Act.
40 CFR 1508.7, *Cumulative Impact.*
49 CFR 100–199, *Pipeline and Hazardous Materials Safety Administration, Department of Transportation*.
49 CFR 171–177, regarding Waste Transportation and Packaging.
49 CFR 195–199, regarding Transportation of Hazardous Liquids by Pipeline.

Czarnecki, R.E., 2008, JT3/CH2M HILL, personal communication regarding asbestos use at Edwards AFB, California, 23 April.

Department of Defense (DOD) STD 6055.9, 2008, *DoD Ammunition and Explosives Safety Standards*, 29 February.

DOD Instructions (DODI)
DODI 4715.3, 1996, *Environmental Conservation Program*, 3 May.
DODI 6050.05, 2008, *DoD Hazard Communication (HAZCOM) Program*, 25 August.
DODI 6055.11, 1995, *Protection of DoD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers*, 21 February.

Edwards Air Force Base Instructions (EAFBI)
EAFBI 23-2, 2005, *Entry, Exit, and Control of Petroleum Transport Vehicles*, 1 September.
EAFBI 32-119, 2008, *Edwards Air Force Base Hazardous Material Management Process*, 10 January.

Earle, D.D., B. Boyer, R.A. Bryson, R.U. Bryson, M.M. Campbell, J.J. Johannesmeyer, K.A. Lark, C.J. Parker, M.D. Pittman, L.M. Ramirez, M.R. Ronning, and J. Underwood, 1997, *Cultural Resources Overview and Management Plan of Edwards AFB, California, Volume 1, Overview of the Prehistoric Cultural Resources.* Document on file at Environmental Management, Edwards AFB, California.

Executive Orders (EO)
EO 11988, 1977, *Floodplains Management*, 24 May.
EO 12580, 1987, *Superfund Implementation*, 23 January.

EO 12898, 1994, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 16 February.
EO 13045, 1997, *Protection of Children from Environmental Health and Safety Risks*, 21 April.
EO 13123, 1999, *Greening of the Government through Efficient Energy Management*, 3 June.

Federal Aviation Administration Form 7460-1, 1999, *Notice of Proposed Construction or Alteration*, February.

French, D. and J. Miller, 2004, *Flood Assessment for Main Base Industrial Area, Edwards Air Force Base, California*, June. Document on file at Environmental Management, Edwards AFB, California.

French, D., C. Dettling, and J. Miller, 2003, *Flood Assessment for Rogers Dry Lake, Edwards Air Force Base, California,* June. Document on file at Environmental Management, Edwards AFB, California.

International Association of Plumbing and Mechanical Officials, 1997, *Uniform Plumbing Code*.

International Conference of Building Officials, 1997, *Uniform Building Code.*

Kern County Air Pollution Control District (KCAPCD) Rule 210.1, 2000, *New and Modified Stationary Source Review (NSR),* 4 May.

KCAPCD Rule 210.7, 1994, *Federal General Conformity Rule*, 13 October.

Military Handbook (MIL-HDBK)
MIL-HDBK 1008C, 1997, *Fire Protection for Facilities Engineering, Design, and Construction*, 10 June.
MIL-HDBK 1022A, 1999, *Petroleum Fuel Facilities*, 1 November.

Mitchell, D., K. Buescher, J. Eckert, D. Laabs, M. Allaback, S. Montgomery, and R. Arnold, Jr., 1993, *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis*.

Mojave Desert Air Quality Monitoring District (MDAQMD) Rule 1303, *Requirements (New Source Review),* 24 September 2001.

National Fire Protection Association (NFPA)
NFPA 1, *Uniform Fire Code*, 2006.
NFPA 70, *National Electrical Code*, 2008.

Public Law (PL)
PL 91-596, 1970, *Occupational Safety and Health Act of 1970*, 29 December, as amended 1 January 2004.
PL 99-499, 1986, *Superfund Amendment and Reauthorization Act of 1986*, 17 October.
PL 101-549, 1990, *Clean Air Act Amendments of 1990*, 15 November.
PL 109-58, 2005, *Energy Policy Act of 2005*, 8 August.

United Facilities Criteria (UFC)
UFC 3-260-01, 2008, *Airfield and Heliport Planning and Design*, 17 November.
UFC 3-310-04, 2007, *Seismic Design for Buildings*, 15 August.
UFC 3-460-03, 2003, *Operation and Maintenance: Maintenance of Petroleum Systems*, 21 January.
UFC 4-010-01, 2003, *DOD Minimum Antiterrorism Standards for Buildings*, 8 October.

UFC Guide Specifications 13 48 00.00 10, 2007, *Seismic Protection for Mechanical Equipment*, October.

United States Air Force (USAF), 2007, *Memorandum of Agreement between California State Fire Marshal, Sacramento, CA and Edwards Air Force Base, CA for Liquid Fuel Supply System Services and Support*, 14 March.

United States Army Corp of Engineers (USACE), 1997, *Grazing and Cropland Management Plan for Edwards Air Force Base, California.*

USACE and AFFTC, 1996, *Environmental Assessment for Borrow Sites at Edwards Air Force Base, California*, November.

United States Code (U.S.C.)
10 U.S.C. 2701, *Environmental Restoration Program*.
15 U.S.C. 2601 et seq., *Toxic Substances Control Act (TSCA) of 1976*.
16 U.S.C. 1531 et seq., *Endangered Species Act of 1973 (ESA)*.
16 U.S.C. 470 et seq., *National Historic Preservation Act of 1966 (NHPA)*, as amended.
16 U.S.C. 470aa–470ll, *Archaeological Resources Protection Act (ARPA) of 1979*.
16 U.S.C. 670a–670o, *Sikes Act of 1960*.
16 U.S.C. 703–712, *Migratory Bird Treaty Act of 1918 (MBTA)*.
29 U.S.C. 654, *Occupational Safety and Health Act, Duties for Employers and Employees*.
33 U.S.C. 1251 et seq., *Clean Water Act (CWA)*.
42 U.S.C. 4321 et seq., *National Environmental Policy Act of 1969 (NEPA)*.
42 U.S.C. 6901–6991, *Resource Conservation and Recovery Act of 1976 (RCRA)*.
42 U.S.C. 7401–7671, *Clean Air Act (CAA) of 1970*.
42 U.S.C. 9601 et seq., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*.

6.0 PREPARER/REVIEWERS

The following people were responsible for the preparation or review of the *Update to the Environmental Assessment for Increasing Routine Flightline Activities, Edwards Air Force Base, California*.

Preparers

Verlyn Newby
Environmental Consultant, JT3/CH2M HILL
Years of Experience: 3

Allen Tamura, PG
Project Manager, JT3/CH2M HILL
Years of Experience: 21

Reviewers

Stephanie Vaughn
Environmental Planner, JT3/CH2M HILL
Years of Experience: 3.5

Michelle Bare
Environmental Planning Section Lead, JT3/CH2M HILL
Years of Experience: 15

Virginia Russell
Environmental Planning Section Manager, JT3/CH2M HILL
Years of Experience: 22

Thomas Rademacher
Environmental Department Manager, JT3/CH2M HILL
Years of Experience: 16

Jacquelyn Hull–Interdisciplinary Team Member
Technical Publications II, JT3
Years of Experience: 9

Linda Massey–Interdisciplinary Team Member
Technical Publications Assistant, JT3
Years of Experience: 9

Doryann Papotta–Interdisciplinary Team Member
Technical Publications III, JT3
Years of Experience: 17

Government Reviewers

Keith Dyas
Environmental Engineer, Environmental Compliance Division

Robert Shirley
Chief, Environmental Conservation Division

Robert W. Wood
Director, Environmental Management

Environmental Management Directorate *NEPA* Assessment Review Group Members
95 ABW Environmental Management Directorate, Conservation Division; 95 ABW Civil Engineering and Transportation Directorate; 95th Aerospace Medical Squadron, Bioenvironmental Engineering Division; AFFTC Judge Advocate; AFFTC Public Affairs; AFFTC Safety; AFFTC Plans and Programs; and 412th Maintenance Group.

7.0 LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE ENVIRONMENTAL ASSESSMENT ARE SENT

95 ABW Civil Engineering Work Management Office
AFFTC Technical Library, Building 1400, Edwards AFB, California
Edwards AFB Library, Rosamond Boulevard, Edwards AFB, California

This page intentionally left blank.

FINAL

APPENDICES

August 2009

APPENDIX A

LIST OF SUPPORT FACILITIES ON THE FLIGHTLINE

This page intentionally left blank.

Table A-1. Main Base Flightline Support Buildings and Facilities

Building No.	Description	Address
1014	Aircraft Research Engineering	214 Hoglan Drive
1015	Aircraft Research Engineering	215 Hoglan Drive
1020	Integration Facility for Avionics Testing	220 Hoglan Drive
1029	Security Police Central Control	229 Hoglan Drive
1030	Benefield Anechoic Facility	230 Hoglan Drive
1199	450th Test Squadron Aircraft Research Engineering	245 South Flightline Road
1207	Aircraft Dynamic Research Test	215 South Flightline Road
1209	Steam Facility Building	213 South Flightline Road
1210	Hangar Maintenance	205 South Flightline Road
1210a	Marine Facility	199 South Wolfe Avenue
1210c	Marine Facility	189 South Wolfe Avenue
1212	Aircraft Research Engineering	209 South Flightline Road
1215	Administrative Office, Non-Air Force	207 South Flightline Road
1220	Test Pilot School	220 South Wolfe Avenue
1222	Marine Aircraft Group 46 Detachment B Supply	210 South Wolfe Avenue
1260	JT3 Administrative Office, Non-Air Force	190 South Wolfe Avenue
1398	Life Support/Test Parachute Flight Operations	29 South Flightline Road
1407	Commander Support Staff 412th Test Squadron	25 South Flightline Road
1409	Aircraft Research Laboratory	37 South Flightline Road
1410	Equipment Research Laboratory	15 South Flightline Road
1411	Equipment Research Laboratory	109 South Flightline Road
1412	Aircraft Research Engineering	35 South Flightline Road
1414	Aircraft Dynamic Research Engineering	105 South Flightline Road
1420	Segregated Magazine Storage	187 South Flightline Road
1423	Base Hazard Storage	185 South Flightline Road
1425	Equipment Research Laboratory	5 South Flightline Road
1430	Petroleum Operations Building/Vehicle	155 South Flightline Road
1431	AETC Studies and Analysis Squadron	180 South Wolfe Avenue
1435	Equipment Research Laboratory	111 South Flightline Road
1439	Equipment Research Laboratory	107 South Flightline Road
1442	Aircraft Support Equipment/Storage	112 South Flightline Road
1600	Aircraft Hangar/Back Shops	300 East Yeager Boulevard
1604	Equipment Research Laboratory	27 North Flightline Road
1606	Material Research Test Laboratory	33 North Flightline Road
1608	Material Research Test Laboratory	31 North Flightline Road
1609	Headquarters Center	30 North Wolfe Avenue
1614	AFCS Maintenance Facility	13 North Flightline Road
1615	Aircraft Corrosion Control	23 North Flightline Road
1616	Communication Facility	5 North Flightline Road
1617	Fire Station 1	11 North Flightline Road
1618	Electric Power Station Building	9 North Flightline Road

Table A-1. Main Base Flightline Support Buildings and Facilities (Continued)

Building No.	Description	Address
1619	Corrosion Control Utility Storage	25 North Flightline Road
1622	Maintenance Dock Systems Facility	21 North Flightline Road
1623	Aircraft Dynamic Research Engineering	35 North Flightline Road
1624	Fuel System Maintenance Dock	17 North Flightline Road
1630	Aircraft Dynamic Research Test	65 North Flightline Road
1632	Financial Services Division	70 North Wolfe Avenue
1633	Comptroller, 31st Test and Evaluation Squadron	60 North Wolfe Avenue
1634	Corrosion Control Facility	30 North Flightline Road
1635	Aircraft Dynamic Research Engineering	115 North Flightline Road
1636	Aircraft Research Engineering	112 North Wolfe Avenue
1642	Aircraft Research Engineering	118 North Wolfe Avenue
1643	Aircraft Research Engineering	114 North Wolfe Avenue
1710	Storage Igloo	20 North Flightline Road
1711	Storage Igloo	28 North Flightline Road
1715	Base Shed Supply and Equipment	34 North Flightline Road
1716	Firing Gun Butt	38 North Flightline Road
1717	Liquid Oxygen Cart Maintenance Building	26 North Flightline Road
1718	Storage, Liquid Oxygen	32 North Flightline Road
1719	Water Fire Pump Station	22 North Flightline Road
1721	Aircraft Dynamic Research Test	18 North Flightline Road
1727	Control Tower	10 North Flightline Road
1735	Propellant Research Lab	60 North Flightline Road
1736	Shop Engineering Test and Storage	68 North Flightline Road
1807	Equipment Research Engineering	189 North Wolfe Avenue
1808	Aircraft Research Engineering	187 North Flightline Road
1810	Aircraft Dynamic Research Engineering	185 North Flightline Road
1812	Aircraft Shelter	191 North Flightline Road
1813	Aircraft Shelter	179 North Flightline Road
1814	Aircraft Shelter	193 North Flightline Road
1815	Aircraft Shelter	181 North Flightline Road
1816	Aircraft Shelter	195 North Flightline Road
1817	Aircraft Shelter	183 North Flightline Road
1820	Aircraft Dynamic Research Test	275 North Flightline Road
1830	Aircraft Research Laboratory	325 North Flightline Road
1833	Aircraft Dynamic Research Test	331 North Flightline Road
1850	Base Engineer Maintenance Shop	315 East Forbes Avenue
1858	Research Equipment Storage	395b North Flightline Road
1860	Base Engineer Maintenance Shop	395a North Flightline Road
1862	Aircraft Dynamic Research Test	397 North Flightline Road
1863	Base Hazardous Storage	293 North Flightline Road
1864	Hangar, Maintenance	395 North Flightline Road
1866	Aircraft Dynamic Research Test	399 North Flightline Road
1867	Equipment Research Laboratory	391 North Flightline Road
1868	Storage, Research Equipment	389 North Flightline Road

Table A-1. Main Base Flightline Support Buildings and Facilities (Continued)

Building No.	Description	Address
1870	Aircraft Dynamic Research Test	385 North Flightline Road
1874	Aircraft Dynamic Research Engineering	365 North Flightline Road
1875	Storage, Research Equipment	353 North Flightline Road
1876	Storage, Research Equipment	357 North Flightline Road
1881	Aircraft Research Engineering	383 North Flightline Road
1884	Warehouse, Supply, and Equipment	388 North Flightline Road
1887	Research Equipment Storage	380 North Flightline Road
1888	Aircraft Research Testing	382 North Flightline Road
1899	Propellant Research Laboratory	290 North Flightline Road
1901	Base Engineer Maintenance Shop	230 North Flightline Road
1902	Aircraft Engine Testing Cell	220 North Flightline Road
1910	Base Supply Administration	194 North Flightline Road
1926	Equipment Research Laboratory	132 North Flightline Road
1928	Base Maintenance Shop	124 North Flightline Road
1931	Storage Liquid Oxygen	128 North Flightline Road
4800	Research, Development, and Test Facility	465 North Flightline Road
4801	Construction and Maintenance Hangar	475 North Flightline Road
4802	Main Hangar	461 North Flightline Road
4806	Warehouse No. 1 (Garage/Battery Shop)	441 North Flightline Road
4807	Research, Development, and Test Facility	441 North Flightline Road
4808	Warehouse No. 2	441 North Flightline Road
4809	Warehouse No. 3 (Aerospace Ground Equipment Support Shop)	429 North Flightline Road
4810	Warehouse No. 4 (Support Building)	419 North Flightline Road
4820	Flight Loading Lab	485 North Flightline Road
4821	Paint Spray Building	491 North Flightline Road
4822	Post Flight Science Support Facility	490 McKay Avenue
4823	Machine/Sheet Metal Shop/HAZMAT Pharmacy	481 North Flightline Road
4824	Communications Facility	425 Lilly Avenue
4825	Integrated Support Facility	445 Thompson Avenue
4826	Aircraft Maintenance Hangar	500 Thompson Avenue
4827	Warehouse No. 9 (Facility Equipment Storage)	411 North Flightline Road
4828	Maintenance Storage Building	429 Swann Avenue
4831	Warehouse No 5 (Shuttle)	505 Thompson Avenue
4832	Warehouse No. 7	470 Swann Avenue
4833	Shuttle Hangar And Shops	545 Thompson Avenue
4837	Warehouse No. 8 (Shuttle)	535 Thompson Avenue
4838	Data Analysis Facility	491 Thompson Avenue
4839	Facility Support Complex	460 Walker Avenue
4840	Research Aircraft Integration Facility	495 North Flightline Road
4841	Project Support Complex	497 Lilly Avenue
4842	Project Support Complex	491 Lilly Avenue
4844	Project Support Complex	483 Lilly Avenue
4845	Portable Storage Container	485 Lilly Avenue

Table A-1. Main Base Flightline Support Buildings and Facilities (Concluded)

Building No.	Description	Address
4846	F-16 Support Complex	475 Lily Avenue
4847	Special Projects Building	465 Lily Avenue
4849	Material Storage Warehouse	445 Swann Avenue
4850	Safety Building	460 Swann Avenue
4851	Audio/Video Support Center	450 Swann Avenue
4852	HAZMAT Storage Facility	Swann Avenue
4853	Fire Protection Pump Station No. 1	515 Thompson Avenue
4854	Fueling Station	467 Swann Avenue
4856	Mobile Storage Building	North Flightline Road
4857	Water Storage Building	470 Swann Avenue
4859	Shuttle Laboratory Facility	North Flightline Road
4860	Shuttle Mate/Demate Device	485 Thompson Avenue
4863	Shuttle Support Administration Building	Lily Avenue
4864	Orbitor Turn-Around	North Flightline Road
4865	Warehouse	North Flightline Road
4870	Range Operations And Maintenance	415 Lily Avenue
4876	Warehouse No. 6 (Shipping And Receiving)	435 Swann Avenue
4877	Fitness Center	Mc Kay Avenue
4886	Steam Plant	449 North Flightline Road
4889	Central Standby Electric Generator Plant	447 North Flightline Road
4890	Central System Hydraulic Pump Plant	463 North Flightline Road

Notes: 1. AETC–Air Education and Training Command
2. AFCS–Automatic Flight Control System
3. HAZMAT–hazardous material

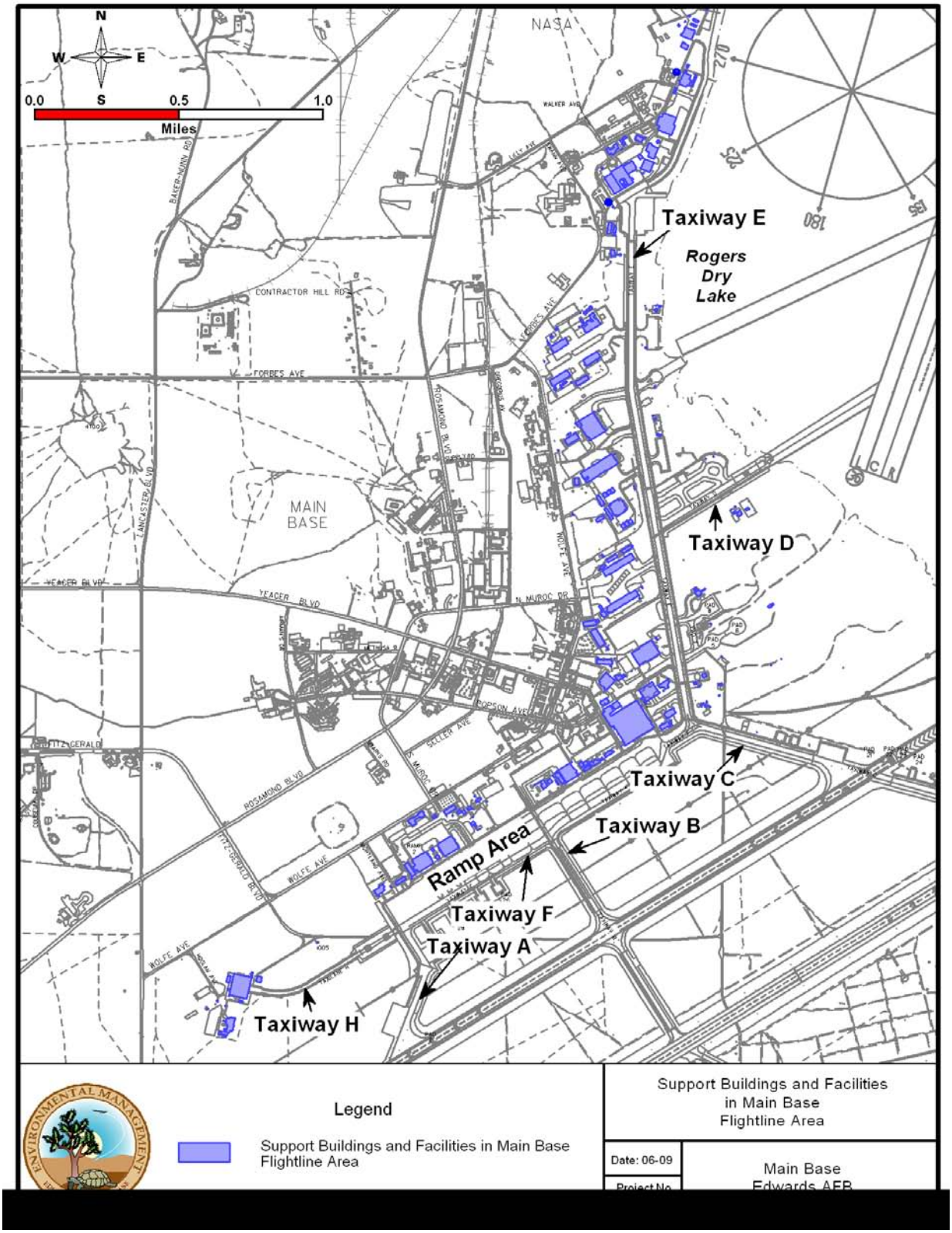


Figure A-1. Location of the Support Buildings and Facilities on the Main Base Flightline

Table A-2. North Base Flightline Support Buildings and Facilities

Building No.	Description	Address
4303	Compressed Air Plant Building	755 North Base Road
4305	Research Equipment Storage	759 North Base Road
4306	Heating Facility Building	757 North Base Road
4307	Research Equipment Storage	753 North Base Road
4318	Base Engineer Covered Storage	751 North Base Road
4400	Research Equipment Storage	773 North Base Road
4401	Research Equipment Storage	769 North Base Road
4402	Research Equipment Storage	777 North Base Road
4410	Liquid Oxygen Storage	771 North Base Road
4412	Meteorological Equipment Shop	775 North Base Road
4444	Research Equipment Storage	779 North Base Road
4452	Utility Vault	783 North Base Road
4456	Fire Station 5	781 North Base Road
4493	Gymnasium	794 North Base Road
4494	Aircraft Research Test	792 North Base Road
4496	Headquarters Group	791 North Base Road
4498	Research Equipment Storage	789 North Base Road
4499	Load And Unload Platform	787a North Base Road
4500	Control Tower	787 North Base Road
4502	Electric Power Station Building	785 North Base Road
4504	Water Fire Pumping Station	795 North Base Road
4505	Aircraft Dynamic Research Test	790 North Base Road
4506	Aircraft Research Engineering	796 North Base Road
4507	Base Supply And Equipment Shed	797 North Base Road
4515	Petroleum Operations Building	801 North Base Road

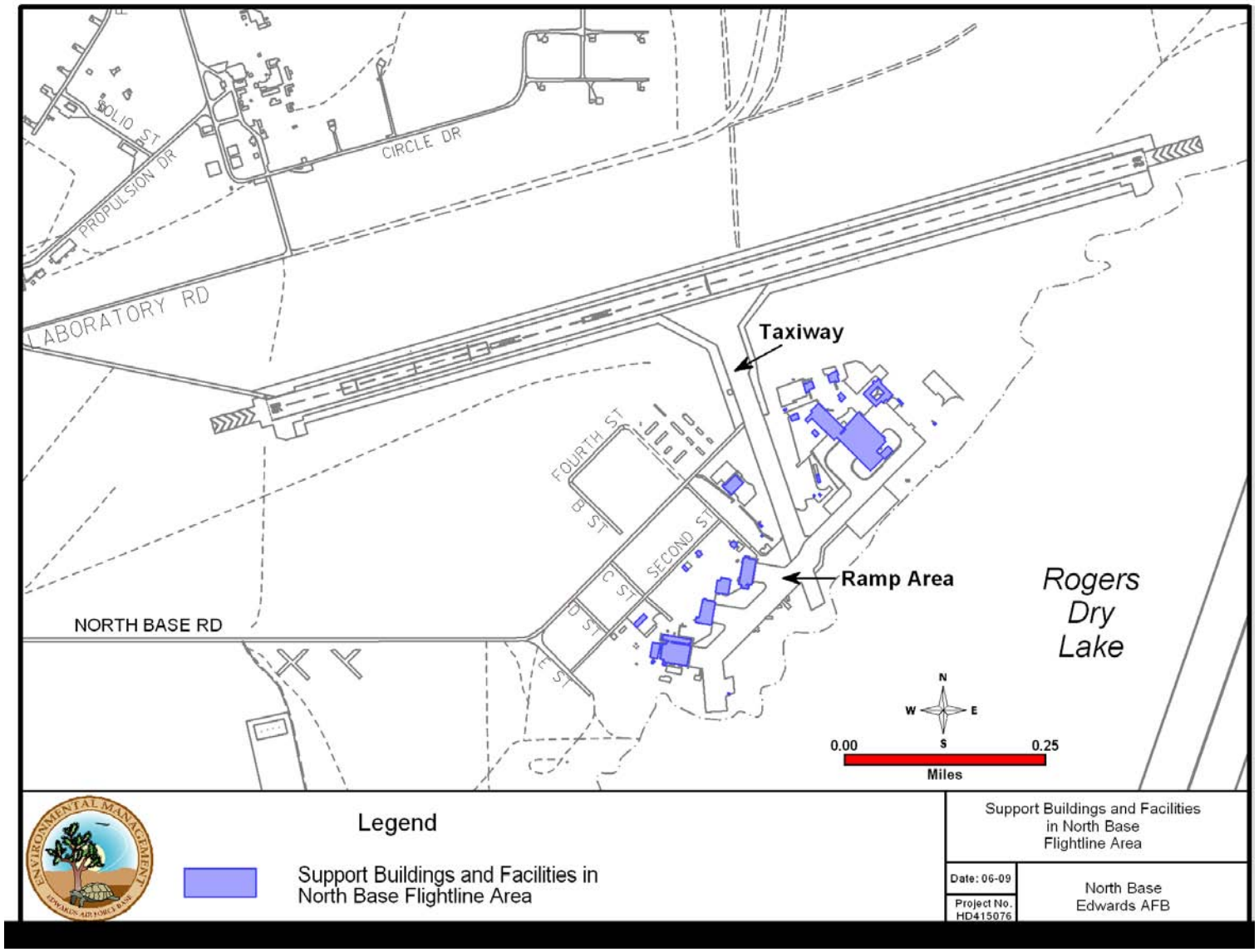


Figure A-2. Location of Support Buildings and Facilities on North Base Flightline

Table A-3. South Base Flightline Support Buildings and Facilities

Building No.	Description	Address
130A	Hydrant Fueling Building	116 Jones Road
250	Fire Station 3	301 Jones Road
164	Base Hazard Storage	128 Jones Road
148	Unmanned Air Vehicle Maintenance Facility	139 Jones Road
133	Petroleum Operations Building	114 Jones Road
300	Aircraft Research Engineering	300 Jones Road
156	Base Warehouse Supply And Equipment	121 Jones Road
304	Electric Power Station Building	304 Jones Road
320	Aero Club	320 Jones Road
160	Propellant Research Laboratory	124 Jones Road
130	Hydrant Fueling Building/Pump House	117 Jones Road
182	Aircraft Research Laboratory	140 Jones Road
151	Aircraft Dynamic Research Engineering	122 Jones Road
181	Aircraft Research Laboratory	138 Jones Road
120	Birk Flight Test Facility	120 Jones Road
158	Base Warehouse Support And Equipment	148 Jones Road
163	Data Processing Installation	130 Jones Road
205	Water Fire Pump Station	119 Jones Road
310	Propellant Facility	312 Jones Road
204	Aircraft Research Laboratory	132 Jones Road
145	Electrical Research Engineering	118 Jones Road

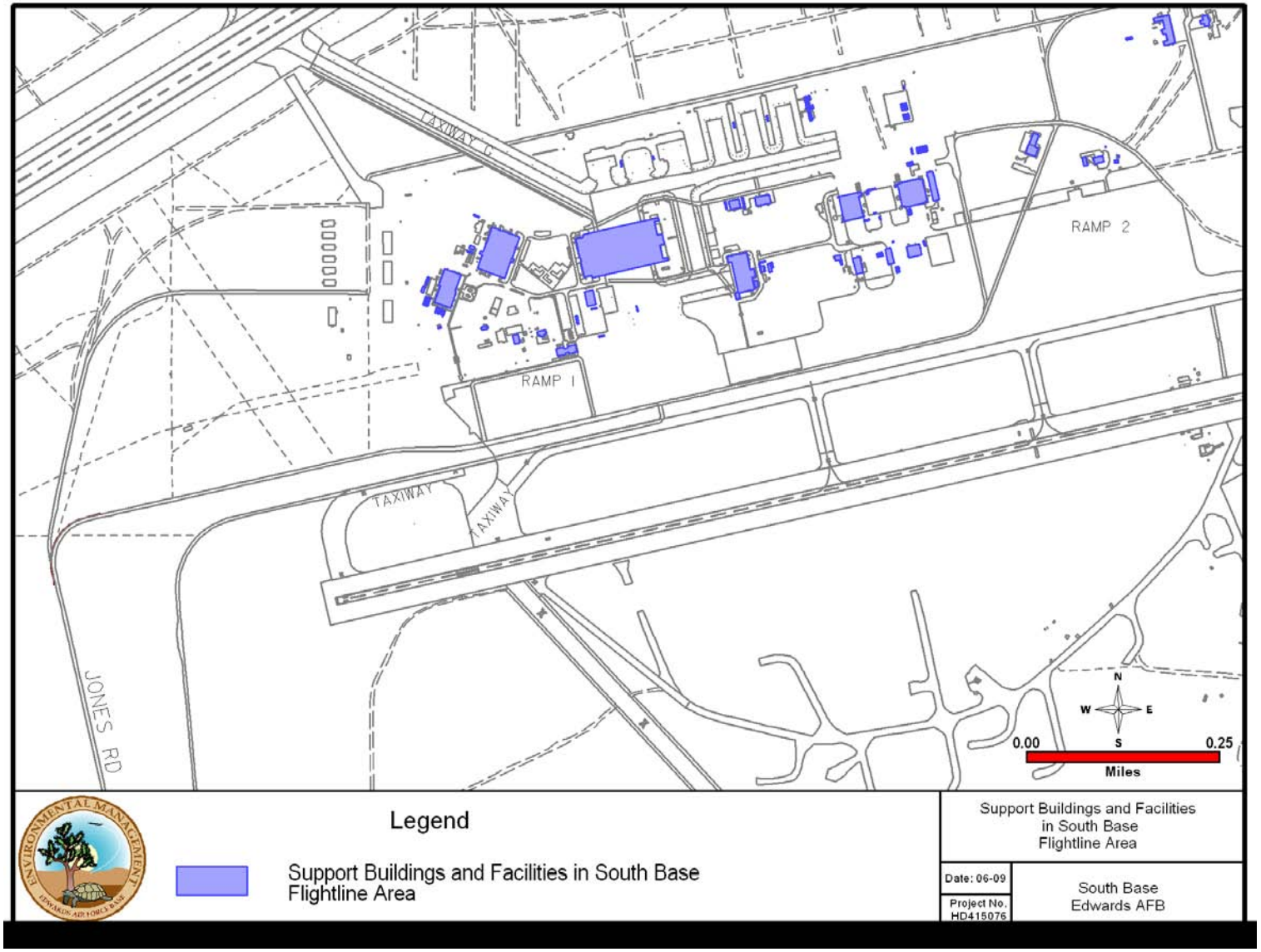


Figure A-3. Location of the Support Buildings and Facilities on the South Base Flightline

This page intentionally left blank.

APPENDIX B

PERMITS, GUIDANCE, AND APPROVALS

This page intentionally left blank.

PERMITS, GUIDANCE, AND APPROVALS

The contractor/proponent performing the work is responsible for obtaining the relevant permits and accomplishing any required notification. Environmental permitting requirements for all work on base are coordinated through the 95th Air Base Wing Environmental Management Directorate. The following permits would be required; however, as permitting requirements change, others may also be required.

a. Air quality operational permits from Kern County Air Pollution Control District (KCAPCD) would be required for powered equipment (e.g., generators, air compressors, or welders) that burns fuel and exceeds 50 brake horsepower. All portable engines and equipment with a rating of 50 brake horsepower and greater must either have an air permit or be registered under the California Air Resources Board Statewide Portable Equipment Registration Program. Operational air permits would be obtained prior to bringing equipment on base.

b. All in-use off-road diesel vehicles (e.g., loaders, crawler tractors, skid steers, backhoes, or forklifts) with maximum power of 50 horsepower or greater must meet fleet requirements, which require fleets to apply exhaust retrofits that capture pollutants before they are emitted to the air.

c. An Air Force Flight Test Center (AFFTC) Information Management Tool (IMT) 5926, *Edwards AFB Civil Engineering Work Clearance Request* (Digging Permit), is required for any trenching or digging operations that extend 12 or more inches below the ground surface.

d. An AFFTC IMT 5852, *Permit for Industrial Wastewater Discharge*, may be required during additions to or disconnection of wastewater lines.

e. Rinsewater or solids separated in oil/water separator systems that are deemed a hazardous waste may require a tiered permit from the Department of Toxic Substances Control in accordance with California hazardous waste regulations.

f. In accordance with Air Force Instruction (AFI) 32-7042, *Waste Management*, a hazardous waste initial accumulation point and its proposed location must be approved by and coordinated with Environmental Management.

g. A traffic control plan shall be filed with the Security Police, Fire Protection Division, and Public Affairs Office.

h. Concurrence with *Memorandum of Agreement between California State Fire Marshal, Sacramento, CA and Edwards Air Force Base, CA for Liquid Fuel Supply System Services and Support* (United States Air Force [USAF], 2007).

i. Concurrence with Title 49 Code of Federal Regulations Part 195, *Transportation of Hazardous Liquids by Pipeline*.

j. Concurrence with California Government Code Section 51010–51019, *The Elder California Pipeline Safety Act of 1981*.

k. Project equipment/operations will generate air emissions. If the engine of a nonmobile source (e.g., generator, compressor, welder, or rock crusher) is greater than 50 brake horsepower, an air permit will be required.

l. Aboveground storage tanks must meet secondary containment of 110 percent of tank volume and be impervious to fuel. Containment design and construction shall include a drain port for drainage. The drain port shall be lockable.

m. Project activities may need to be reviewed and approved by the base Fire Department. Contact the Fire Protection Division for specific requirements.

n. Project activities may need to be reviewed and approved by the base Safety Office. Contact the Safety Office for specific requirements.

o. Project activities may need to be reviewed and approved by the base Weapons Safety Office. Contact the Weapons Safety Office for specific requirements.

p. Project activities involving welding, torching, cutting and brazing require an Air Force Form 592, *USAF Welding, Cutting and Brazing Permit* (Hot Work Permit), from the Fire Department.

q. A Section 106 consultation from the Advisory Council on Historic Preservation and/or California State Historic Preservation Office would be necessary for activities that could affect properties with historic, architectural, or cultural value that are listed or eligible for listing on the National Register of Historic Places (NRHP) and according to the *National Historic Preservation Act of 1966* as amended (16 United States Code [U.S.C.] 470 et seq.).

r. The *Biological Opinion for Routine Operations and Facility Construction within the Cantonment Areas of Main and South Bases, Edwards Air Force Base, California* (1-6-91-F-28) (1991); *Biological Opinion for Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (1-8-96-F-56) (1997); and *Biological Opinion for Routine Operations, Construction Projects, Runway Expansion, Maintenance and Operation, and Facility Maintenance of Roads and Utilities at the Jet Propulsion Laboratory and North Base Areas of the Air Force Flight Test Center in Kern, Los Angeles and San Bernardino Counties, California* (1-87-96-F-52) (1997) were issued by the United States Fish and Wildlife Service (USFWS). These biological opinions contain terms and conditions to be followed for desert tortoise (*Gopherus agassizii*) under the Existing Mission Scenario and other alternative scenarios. Reinitiation of formal consultation with the USFWS for routine flightline activities would be required if any actions within the Main Base, North Base, South Base, and Rogers Dry Lake flightline areas result in the following:

(1) The amount or extent of incidental take allowed under the biological opinions are reached;

(2) New information reveals effects of the action considered under the biological opinions that may adversely affect listed species in a manner or to an extent not considered in the biological opinions; and/or,

(3) New species other than the desert tortoise is listed or new critical habitat area is designated that may be affected by ongoing routine activities.

APPENDIX C

REGULATIONS AND GUIDANCE DOCUMENTS

This page intentionally left blank.

REGULATORY REQUIREMENTS/GUIDANCE RELATED TO ENVIRONMENTAL ISSUES

This summary identifies the regulatory requirements/guidance applicable during the Environmental Impact Analysis Process (EIAP).

Land Use

Air Force Instruction (AFI) 32-1023(I), *Planning and Design of Airfields*, provides guidance to personnel responsible for planning, developing, siting, and the layout of runways, taxiways, aprons, pads, and support facilities for fixed- and rotary-winged aircraft. This instruction provides references to the documents that contain the criteria and standards for these facilities and establishes a waiver process for deviations from the criteria and standards.

AFI 21-101, *Aircraft and Equipment Maintenance Management* (2006) and Air Force Materiel Command (AFMC) Supplement 1 (2007); and provide the minimum essential guidance and procedures for safely and effectively maintaining, servicing, and repairing aircraft and support equipment.

AFI 32-7062, *Air Force Comprehensive Planning*, contains the responsibilities and requirements for comprehensive planning and describes the procedures for developing, implementing, and maintaining the base general plan within the installation's comprehensive plan.

AFI 32-7063, *Air Installation Compatible Use Zone Program* (2005), identifies the requirements to develop, implement, and maintain the Air Installation Compatible Use Zone program. This instruction applies to all Air Force installations with active runways located in the United States and its territories, including government-owned, contractor-operated facilities.

Air Force Flight Test Center Instruction (AFFTCI) 11-2, *Ground Operations* (2004), applies to all ground agencies in support of aircraft operations at Edwards Air Force Base (AFB).

AFFTCI 11-15, *Scheduling Procedures for Aircraft and Air/Ground Support*, contains procedures, policies, and responsibilities for all aircraft operations on Edwards AFB.

AFFTCI 10-2, *Control of Vehicles on the Airfield*, sets policies, procedures, and responsibilities for all agencies, including associates and contractors, who operate or support vehicles on the Edwards AFB flightline.

AFJMAN 24-306, *Manual for the Wheeled Vehicle Driver*, establishes the criteria civilian and military vehicle drivers must meet to be certified and identifies the vehicle operators' responsibilities.

Flight safety hazards from vertical obstructions (e.g., towers) are regulated by the Federal Aviation Administration (FAA). A *Notice of Proposed Construction or Alteration* (FAA Form 7460-1) must be filed with the FAA and approved as not creating an obstacle for aircraft.

Air Quality

The 1970 *Clean Air Act* (*CAA*) (42 United States Code [U.S.C.] 7401–7671) and the 1990 *Clean Air Act Amendments* (*CAAA*) (Public Law [PL] 101-549), respectively, are the body of federal laws that require the United States Environmental Protection Agency (U.S. EPA) and each state to regulate air pollution emissions from stationary and mobile sources to protect public health and welfare. Air quality regulations were first promulgated with the *CAA* and revised with the *CAAA*.

The *CAAA* require the U.S. EPA to establish and maintain National Ambient Air Quality Standards (NAAQS) that are used to manage air quality across the country. Under the 1988 *California Clean Air Act* (California Health and Safety Code [H&SC], Statutes of 1988, Chapter 1568), California has adopted ambient air quality standards, known as the California Ambient Air Quality Standards, which are published in Title 17, California Code of Regulations, Section 70200, *Table of Standards*. The California Ambient Air Quality Standards are more stringent than NAAQS. Pollutants for which standards have been established are termed 'criteria' pollutants. The standards are based on criteria that show a relationship between pollutant concentrations and effects on health and welfare. The U.S. EPA and the state establish acceptable pollutant concentration levels to serve as ambient air quality standards.

Title 40 Code of Federal Regulations (CFR) Part 61, *National Emission Standards for Hazardous Air Pollutants*, states that in addition to complying with the provisions of Part 61, the owner or operator of a stationary source subject to Part 61 standards may be required to obtain an operating permit issued by an authorized state air pollution control agency or by the administrator of the U.S. EPA pursuant to Title V of the *CAA*, as amended 15 November 1990.

Under the *CAAA*, Title V requires air agencies to establish federal operating permit programs and major sources of air pollutants to obtain Title V operating permits. A Title V operating permit is an all-encompassing permit that includes all local air district permits and regulatory requirements and documents compliance with other *CAAA* regulations.

Title I of the *CAAA* requires states with nonattainment areas to develop regulations and plans, known as State Implementation Plans (SIP), describing the measures the state would take to achieve attainment with NAAQS. Within California, the authority to regulate sources of air emissions resides with the California Air Resources Board (CARB) and is delegated to local air pollution control and air quality management districts. Each air district prepares SIP elements for the areas under their regulatory jurisdiction and submits the elements to the CARB for review and approval. The CARB then incorporates the individual air district elements into a statewide SIP. The SIP is then submitted to the U.S. EPA for approval and publication in the *Federal Register*. The local air districts then enact rules and regulations to achieve the SIP requirements.

California State Assembly Bill (AB) 32, *California Global Warming Solutions Act of 2006*, requires the CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism; and adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas reductions.

Water Resources

The *Clean Water Act* (*CWA*) (33 U.S.C. 1251 et seq.), as amended, is designed to restore and maintain the chemical, physical, and biological integrity of surface waters. The *CWA* establishes effluent standards on an industry basis and addresses water pollution issues through a permitting system designed to control, and eventually eliminate, water pollution. Violations of the *CWA* can result in large fines and/or imprisonment.

Air Force Instruction 32-7041, *Water Quality Compliance* (2003), provides details of the Air Force Water Quality Compliance Program. It applies to generating, collecting, treating, reusing, and disposing of domestic and industrial wastewater, stormwater, nonpoint-source runoff, sewage sludge, and water treatment residuals. It also explains how to assess, attain, and sustain compliance with the *CWA*; other federal, state, and local environmental regulations; and related Department of Defense (DOD) and Air Force directives.

Activities on Edwards AFB are required to adhere to the terms and conditions of the *Storm Water Pollution Prevention Plan (SWPPP), Edwards Air Force Base, California* (Air Force Flight Test Center [AFFTC], 1998c). The SWPPP identifies and assesses sources of stormwater pollution and develops practices and controls to reduce the amount of pollutants in stormwater discharges.

Air Force Flight Test Center Instruction 32-6, *Edwards AFB Wastewater Instructions* (1995), establishes base policy; assigns responsibility for wastewater system oversight and operation; and for accomplishing, monitoring, and reporting requirements of the CWA and associated directives. It applies to domestic and nondomestic wastewater treatment and pretreatment systems, including, but not limited to, collection systems, trucked wastewater, lift station, septic tanks, stormwater treatment, industrial wastewater treatment, oil/water separators, grease traps, leachate, and groundwater treatment facilities. It applies to all discharges and emphasizes eliminating, reducing, and controlling nondomestic wastewater. Environmental Management establishes and publishes technical policy and guidance through this instruction to base organizations for collection, treatment, storage, and disposal of domestic and industrial wastes. Environmental Management establishes restrictions on what can be discharged and what volumes and concentrations will be permitted.

Safety and Occupation Health

The Occupational Safety and Health Administration (OSHA) developed standards to promote a safe working environment. The standards establish general environmental controls, including personnel protective equipment, wherever necessary, because of hazards, processes, or the environment. Exposure limits for noise, ionizing and nonionizing radiation, and toxic and hazardous substances have been established. The *Occupational Safety and Health Act of 1970* (*OSH Act*) (PL 91-596, amended 2004) also provides standards for emergency response to releases of hazardous chemicals and wastes.

Federal OSHA requirements and AFIs are the applicable regulatory requirements. California OSHA regulations do not apply to Edwards AFB DOD workers (e.g., military and civilian). However, independent contractors are responsible for meeting California OSHA requirements.

Statutory and regulatory requirements of the federal OSHA and Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) standards, which apply to the safety of workers on Edwards AFB, are enforced locally by Bioenvironmental Engineering, Ground Safety, and the Fire Department. In addition, operational safety is supervised by various offices for specific activities. The following guidance documents are enforced by the Air Force:

a. AFI 91-202, 1998, *The U.S. Air Force Mishap Prevention Program*;

b. AFI 91-301, 1996, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, and AFMC Supplement, 1997;

c. AFI 91-302, 1994, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Standards*;

d. AFOSH Standard (STD) 48-21, 1993, *Hazard Communication*;

e. AFOSH STD 48-20, *Occupational Noise and Hearing Conservation Program;*

f. AFOSH STD 91-501, 2004, *Air Force Consolidated Occupational Safety Standard*, and AFMC Supplement 1, 2006;

g. AFOSH STD 48-9, *Radio Frequency Radiation (RFR) Safety Program*;

h. AFOSH STD 48-139, *Laser Radiation Protection Program*;

i. Air Force Policy Directive (AFPD) 32-70, 1994, *Environmental Quality*;

j. AFPD 90-8, 2005, *Environment, Safety, and Occupational Health*;

k. AFPD 91-2, 1993, *Safety Programs*;

l. AFPD 91-3, 1993, *Occupational Safety and Health*; and

m. Air Force Joint Manual (AFJMAN) 91-201, *Explosives Safety Standards*, which implements AFPD 91-2, *Safety Program*; and

n. DOD Standard 6055.9, *DoD Ammunition and Explosives Safety Standards* (July 1999)

o. Department of Defense Instruction (DODI) 6055.11, *Protection of DoD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers*, adopts the radiofrequency exposure guidelines and updates procedures for protection of personnel from radiofrequency electromagnetic fields.

p. Department of Defense Instruction 6050.05, *DoD Hazard Communication (HAZCOM) Program*, protects DOD workers from accidental death, injury, or occupational illness from hazardous materials or waste.

q. Title 29 U.S.C. 654, *Occupational Safety and Health Duties of Employers and Employees (General Duty Clause)*, states that employers shall provide a workplace free of recognized hazards that cause, or are likely to cause, death or serious physical harm.

r. Title 29 CFR 1910.95, *Occupational Noise Exposure*, states that protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in the regulation.

s. Title 29 CFR 1926.1101, *Asbestos*, regulates exposure in all work, and in particular to demolition or salvage of structures, as defined in 29 CFR 1926.1101(a)(1).

t. Title 29 CFR 1910.1025, *Lead*, applies to all occupational exposures to lead in all industries covered by the *OSH Act*.

Hazardous Waste /Materials and Solid Waste

The U.S. EPA administers the *Resource Conservation and Recovery Act of 1976* (*RCRA*) (42 U.S.C. 6901–6991). This act regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste. It places responsibility for hazardous waste on the facilities generating the waste and requires them to meet various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and recordkeeping.

The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (*CERCLA*) (42 U.S.C. 9601–9675), enacted by Congress on 11 December 1980, provides broad federal authority to respond directly to releases, or threatened release, of hazardous substances that may endanger public health or the environment. The act authorizes short-term removal actions and long-term remedial response action. The act establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for release of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified.

The *Toxic Substance Control Act* (*TSCA*) (15 U.S.C. 2601) is administered by the U.S. EPA and is intended to ensure that the human health and environmental effects of chemical substances are identified and adequately addressed prior to production or transport of those substances. Chemical substances regulated by the TSCA include "Any organic or inorganic substances of a particular molecular identity including any combination of such substances occurring, in whole or in part, as a result of chemical reaction or occurring in nature and any element or uncombined radical."

Title 29 CFR 1910.1200, *Hazard Communication*, states that "…all hazardous materials shall be documented with required material safety data sheets as part of a complete hazardous materials inventory."

AFI 32-7042, *Waste Management* (2009), implements AFPD 32-70, *Environmental Quality* (1994). Air Force Instruction 32-7042 identifies compliance requirements for all solid and hazardous waste, except radioactive waste. In the United States and its territories, this guidance is intended to be used with applicable federal, state, and local standards for solid and hazardous waste. Specifically, it contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in, and disposal, as well as procedures for managing disposal contracts, inspections, permits, and recordkeeping. This document refers to AFI 32-7080, *Pollution Prevention Program* (1994), for guidance on recycling.

AFI 32-7086, *Hazardous Materials Management* (2004), implements AFPD 32-70, July 1994; AFPD 23-1, *Materiel Management Policy and Procedures*, March 2006; AFPD 90-8, *Environmental, Safety, and Occupational Health*, January 1999; AFPD 90-9, *Operational Risk*

Management; and AFPD 91-3, *Occupational Safety and Health*, September 1993. It establishes procedures and standards that govern management of hazardous materials (HAZMAT) throughout the Air Force. It applies to all Air Force personnel who authorize, procure, issue, use, or dispose of HAZMAT in the course of their official duties; and to those who manage, monitor, or track any of the preceding processes, whether government or contractor personnel perform the processes.

Edwards AFB Instruction (EAFBI) 32-119, *Edwards Air Force Base Hazardous Material Management Process* (2008), which superseded AFFTCI 32-19, reaffirmed implementation of AFI 32-7086, *Hazardous Materials Management* (2004). It provides guidance for personnel responsibilities and procedures essential to operate an effective HAZMAT management program on Edwards AFB. This instruction contains guidance for all DOD, contractor, and tenant organizations. EAFBI 32-119 is implemented to ensure that the base remains in compliance with all applicable federal, state, local, and Air Force regulations and laws regarding HAZMAT management. This instruction involves the use of information systems and positive control of hazardous material to minimize occupational exposures, monitor and minimize environmental releases, and minimize hazardous waste disposal. The HAZMAT processes are reviewed to ensure that the least occupationally and environmentally HAZMAT are used. All HAZMAT transactions would occur using the current automated data system fielded for use at Edwards AFB.

A key component of the Hazardous Material Management Program is the HAZMAT Management Process Team. It is comprised of specialists from Environmental Management, Contracting, Ground Safety, Supply, Fire Department, and Bioenvironmental Engineering, who are responsible for developing and implementing policies concerning the Hazardous Material Management Process. The workplace supervisor reviews HAZMAT processes. Environmental Management, Ground Safety, and Bioenvironmental Engineering would ensure that the most occupationally and environmentally friendly HAZMAT is used. All HAZMAT transactions occur using the most current automated data system fielded for use on Edwards AFB.

The *Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042* (HWMP) (95 ABW, 2005a) supports Air Force regulations and is intended to ensure compliance with applicable federal, state, and local regulations. The objective of the HWMP is to provide sufficient administrative direction and instructions for originators of *RCRA* and non-*RCRA* wastes to properly characterize, package, label, store, treat, handle, and transport hazardous waste at Edwards AFB. The goals are to ensure compliance with the applicable federal, state, and local hazardous waste regulations; simplify administrative procedures; and reduce pollution and environmental impacts through improved waste management practices.

The *Municipal Solid Waste Management Plan (MSWMP) for AFFTC/EMCP (AFFTC/ Environmental Management Directorate, Environmental Quality Division, Pollution Prevention Branch), Edwards Air Force Base, California* (AFFTC, 2000) describes Environmental Management's functional management of municipal solid waste disposal and recycling at Edwards AFB. The purpose of the plan is to comply with federal, state, and local regulations and Air Force policy and guidance on the management of nonhazardous municipal solid waste.

The *Air Force Flight Test Center Oil and Hazardous Substance Spill Prevention and Response Plan* (AFFTC, 1993) is intended to fulfill the requirements of a Spill Prevention

Control and Countermeasures (SPCC) Plan in accordance with (IAW) 40 CFR 112, *Oil Pollution Prevention*, and an Oil Hazardous Substance Pollution Contingency Plan IAW 40 CFR 300, *National Oil and Hazardous Substances Pollution Contingency Plan*. The *Oil and Hazardous Substance Spill Prevention and Response Plan* describes general AFFTC procedures and policies for responding to a spill incident and is not intended to be a site-specific plan for all facilities at Edwards AFB. Site-specific contingency plans should be developed and posted for all facilities at Edwards AFB. The SPCC portion of the plan primarily pertains to spill prevention and includes a discussion of the major types of spill prevention procedures, methods, and equipment incorporated into the base facilities. The Contingency Plan portion of the plan specifies procedures to be followed when responding to releases, accidents, and spills involving oils or hazardous substances. These include spill detection, reporting, containment, cleanup, and disposal procedures. The *Oil and Hazardous Substance Spill Prevention and Response Plan* is supported by several vital squadrons, who provide the specific information associated with the facilities found on Edwards AFB.

Biological Resources

The *Endangered Species Act of 1973* (*ESA*) (16 U.S.C. 1531 et seq.) provides a framework for the protection of endangered and threatened species. Federal agencies may not jeopardize the existence of listed species, which includes ensuring that actions they authorize, fund, or carry out, do not adversely affect the species or adversely modify designated critical habitats. Under the *ESA*, all federal departments and agencies must utilize their authorities, as appropriate, to promote the recovery of listed species. In addition, the *ESA* prohibits all persons, including federal agencies, from harming or killing (taking) individuals of a listed species without authorization. While federal agencies must consult with the United States Fish and Wildlife Service (USFWS) when their activities may affect listed species, projects cannot be stopped unilaterally by the USFWS; however, for any anticipated take to be authorized, applicable measures developed in the consultation to minimize the take must be followed.

The *Migratory Bird Treaty Act of 1918* (*MBTA*) (16 U.S.C. 703–712), as amended, provides for federal protection of all migratory bird species, their active nests, and eggs. Permits are required to remove these birds from their roosting and nesting areas. The federal government is exempt from the *MBTA* permit requirements based on the court decision covered in the *MBTA*, but must minimize take caused by their activities. Nonfederal contractors are required to obtain a depredation permit from the USFWS prior to removal or disturbance of nesting birds.

The *Sikes Act* (16 U.S.C. 670a–670o), as amended, provides for cooperation between the Departments of the Interior and Defense and state agencies in planning, developing, and maintaining fish and wildlife resources on military installations throughout the United States.

The *California Endangered Species Act* (*CESA*) (California Fish and Game Code 2050 et seq.) generally parallels the main provisions of the *ESA* and is administered by the California Department of Fish and Game. Under the *CESA*, the term ‘endangered species’ is defined as a “species of plant, fish, or wildlife which is in serious danger of becoming extinct throughout all, or a major portion of its range” and is limited to species native to California. The *CESA* establishes a petitioning process for the listing of state threatened or endangered species, and the California Department of Fish and Game is required to adopt regulations for this process. The

CESA prohibits the taking of state-listed species except as otherwise provided in state law. Unlike the *ESA*, the *CESA* applies prohibitions to species petitioned for state listing (e.g., state candidates).

Air Force Instruction 32-7064, *Integrated Natural Resources Management* (2004), implements AFPD 32-70 and DODI 4715.3, *Environmental Conservation Program*. Air Force Instruction 32-7064 explains how to manage natural resources on Air Force property in compliance with federal, state, and local standards. The *Integrated Natural Resources Management Plan, Edwards AFB Plan 32-7064* (95 ABW, 2007b) is a key tool for managing the installation's natural resources.

The following programmatic Biological Opinions obtained from the USFWS indicate natural biological habitats would not be jeopardized by routine flightline activities.

a. *Biological Opinion for Routine Operations and Facility Construction within the Cantonment Areas of Main and South Bases, Edwards Air Force Base, California* (1-6-91-F-28), 4 December 1991;

b. *Biological Opinion for Routine Operations, Construction Projects, Runway Expansion, Maintenance and Operation, and Facility Maintenance of Roads and Utilities at the Jet Propulsion Laboratory and North Base Areas of the Air Force Flight Test Center in Kern, Los Angeles and San Bernardino Counties, California* (1-87-96-F-52); and

c. *Biological Opinion for the Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (1-8-96-F-56), which authorizes use of Borrow Sites A, B (16), C, 1, 5, 21, 23, and 28.

Cultural Resources

National Historic Preservation Act of 1966 (*NHPA*), as amended (16 U.S.C. 470 et. seq.), provided for the establishment of the National Register of Historic Places (NRHP) (National Register) and authorized the establishment of criteria to determine the eligibility of cultural sites for listing on the NRHP. Section 106 of the *NHPA* requires federal agencies to evaluate the effects of their activities and programs on cultural resources, which include prehistoric and historic archaeological resources, historic resources, and traditional cultural places. Section 110 of the *NHPA* directs federal agencies to undertake, to the maximum extent possible, planning and actions necessary to minimize harm to cultural resources under their ownership or control, or affected by their activities and programs included in or eligible for inclusion in the National Register. Compliance with *NHPA*; 36 CFR 800, *Protection of Historic Properties;* and AFI 32-7065, *Cultural Resources Management,* at Edwards AFB is coordinated by the Base Historic Preservation Officer.

Archaeological Resources Protection Act of 1979 (*ARPA*) (16 U.S.C. 470aa–470ll) addresses the growing concern about the plundering of archaeological and historic sites. The act makes it illegal to remove any archaeological resources from federal lands without a permit. Arrowheads lying on the surface are the only exception. Violations of the *ARPA* can result in fines of up to $250,000 and up to 5 years imprisonment.

Geology and Soils

The Air Force, in September 1990, along with the U.S. EPA, Region IX; California Department of Health Services (now the California Department of Health Care Services); and California Regional Water Quality Control Board, Lahonton Region, signed a Federal Facility Agreement (FFA) pursuant to the following authority:

a. *CERCLA*, Section 120, as amended by *Superfund Amendment and Reauthorization Act* (PL 99-499);

b. *RCRA* (42 U.S.C. 6901) Sections 3004(u) and (v), 3008(h), and 6001;

c. *CWA*;

d. *National Environmental Policy Act of 1969* (*NEPA*);

e. Executive Order 12580, *Superfund Implementation*;

f. *Environmental Restoration Program* (10 U.S.C. 2701);

g. California Health and Safety Code, Division 20, Chapters 6.5, *Hazardous Waste Control*, and 6.8, *Hazardous Substance Account*; and

h. California Water Code, Division 7, *Water Quality*.

The FFA requires compliance with the *National Oil and Hazardous Substances Pollution Contingency Plan*, *CERCLA*, *RCRA*, and applicable state laws. Under the FFA, the Air Force agreed to undertake, seek adequate funding for, fully implement, and report on the following site tasks: remedial investigation; federal and state Natural Resource Trustee Notification and Coordination; feasibility studies; all response actions; and operation and maintenance of response actions.

Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code Section 2621–2630) provides for the adoption and administration of zoning laws, ordinances, rules, and regulations by cities and counties in implementation of the general plan that is in effect in any city or county. The Legislature declares that this act is intended to provide policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults. Further, it is the intent of this act to provide the citizens of the state with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings against ground shaking.

The *CERCLA* also applies to geology and soils in the event of releases or threatened releases of hazardous substances to soils and groundwater that may endanger public health or the environment.

Biological Opinion 1-8-96-F-56, 19 March 1997, approves sites from which fill materials can be obtained and recycled rocks and concrete may be deposited.

Socioeconomic

The *NEPA* (42 U.S.C. 4321 et seq.) requires the federal government to use all practicable means and resources to the end that the nation may assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; and preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice.

Infrastructure

Air Force Flight Test Center Instruction 32-6, *Edwards AFB Wastewater Instruction* (1995), establishes base policy and assigns responsibility for wastewater system oversight and operation and for accomplishing monitoring and reporting requirements of the *Clean Water Act* (33 U.S.C. 1251 et seq.) and associated publications/directives.

Title 49 CFR 195–199, *Transportation of Hazardous Liquids by Pipeline*, prescribes safety standards and reporting requirements for pipeline facilities used to transport hazardous liquids or carbon dioxide.

The *Elder California Pipeline Safety Act of 1981* (California Government Code Section 51010–51019) designates the State Fire Marshal as having exclusive safety regulatory and enforcement authority over intrastate hazardous liquid pipelines, and to act as agent for the United States Secretary of Transportation to implement federal pipeline safety regulations for those portions of interstate pipelines located within California.

Air Force Instruction 23-201, *Fuels Management* (2004), establishes policies and procedures for fuel operations. It applies to all Air Force activities, including Air Force Reserve and Air National Guard units that receive, store, issue, perform quality control, and account for aviation fuels, ground fuels, cryogenic fluids, and missile propellants.

Air Force Instruction 23-204, *Organizational Fuel Tanks* (1994), provides guidelines and procedures for establishing and operating organizational fuel tanks, and includes directions for preparing AF Form 500, *Daily and Weekly Fuel Report*. This instruction applies to every base and tenant organization using and managing organizational fuel tanks.

Air Force Instruction 32-7044, *Storage Tank Compliance* (2003), implements AFPD 32-70. It identifies compliance requirements for underground and aboveground storage tanks and associated piping that store petroleum and hazardous substances.

An AFFTC IMT 5852, *Industrial Wastewater Discharge Permit*, may be required during additions to or disconnection of wastewater lines during the project activities.

The *Uniform Building Code* (International Conference of Building Officials, 1997) establishes minimum standards to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures.

The *Uniform Fire Code* (National Fire Protection Association [NFPA] 1, 2006) establishes provisions necessary for fire prevention and fire protection.

The *National Electrical Code* (NFPA 70, 2008) was first published in 1897 and is adopted and enforced in all 50 states. It provides practical safeguarding of persons and property from hazards arising from the use of electricity by establishing requirements for electrical wiring and equipment in virtually all buildings. It specifically covers the installation of electric conductors and equipment in public and private buildings, industrial substations, and other premises (e.g., parking lots); installation of fiber-optic cable, wiring, general electrical equipment, the use of electricity in specific occupancies and equipment; special conditions (e.g., emergency and standby power or conditions requiring more than 600 volts); and communication systems.

The *Uniform Plumbing Code* (International Association of Plumbing and Mechanical Officials, 1997) establishes standards applicable to the erection, installation, alteration, repair, relocation, replacement, addition to, or maintenance of plumbing systems. These standards ensure protection of public health, safety, and welfare.

Energy Conservation

The *Energy Policy Act of 2005* (PL 109-58) requires federal entities to identify and accomplish all energy and water conservation measures with payback periods of less than 10 years.

Executive Order 13123, *Greening of the Government through Efficient Energy Management*, identifies the Department of Energy as the lead agency responsible for implementing the act and establishes seven goals regarding energy use that are applicable to federal agencies. These goals target reduction of:

a. greenhouse gases;

b. petroleum use;

c. energy use by industrial, laboratory, and other facilities;

d. total energy use (as measured at the source);

e. water consumption (and associated energy use); and

f. expanded use of renewable energy.

The *Edwards Air Force Base Energy Plan* (AFFTC, 1995b) serves as a component of the *General Plan, Edwards Air Force Base, California* (95 ABW, 2009c) and documents the policies, direction of development, and specific projects associated with the base's desire to meet the national energy goals established by the *Energy Policy Act of 2005* (PL 109-58).

This page intentionally left blank.

APPENDIX D

BIOLOGICAL OPINIONS

This page intentionally left blank.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
Federal Building, 24000 Avila Road
Laguna Niguel, California 92656

December 4, 1991

Robert W. Wood, Chief
Environmental Planning and Compliance Branch
6500 SPTW/DEV
Edwards Air Force Base, California 93523-5000

Subject: Biological Opinion for Routine Operations and Facility Construction within the Cantonment Areas of Main and South Bases, Edwards Air Force Base, California (1-6-91-F-28)

Dear Mr. Wood:

This biological opinion responds to the Department of the Air Force's (Air Force) request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act (Act). Your request was dated May 14, 1991, and was received by us on May 16, 1991. At issue are the impacts that routine maintenance of utilities and roads within the cantonment areas of Main and South Bases, Edwards Air Force Base, California may have on the desert tortoise (Gopherus agassizii), a federally listed threatened species.

This biological opinion was prepared using information: contained in your May 14, 1991, request for consultation to the Service's Ventura Office regarding the proposed action; obtained during informal consultation between our staffs; and contained in our files.

Biological Opinion

It is the opinion of the Service that the proposed action is not likely to jeopardize the continued existence of the desert tortoise. Critical habitat has not been designated for this species. Therefore, the proposed action will not result in the adverse modification of critical habitat.

Description of the Proposed Action

The action proposed by the Air Force is intended primarily to establish routine procedures for compliance with the Act when desert tortoises are encountered within the cantonment areas of the Main and South Bases at Edwards Air Force Base (Base). These areas support the Base's flight test mission and contain two active runways, hangars, ground equipment storage yards, fueling operations, dormitories, family housing, dining establishments, post office, library, recreational facilities, and offices. Approximately 3,000 military personnel and their families reside on the base; thousands more commute to the base daily.

The procedures proposed by the Air Force include:

1. Returning desert tortoises that enter the industrial areas of the base to the wild or to captivity, depending on the suspected origin of the animals;

2. Registration of all existing captive desert tortoises that are currently kept in the multi-family housing area;

3. Initiation of an education program on desert tortoises that would be presented to all military, civilian, and contracting personnel who use the base; and

4. Continuation of pre-construction surveys in those portions of the cantonment area where desert tortoise may occur. Based on the results of the surveys contracted by the Air Force to support the request for this formal consultation, the Air Force is proposing that surveys for desert tortoises be discontinued south of Mojave Boulevard (see enclosed Figure 1 from Computer Sciences Corporation 1991). Pre-planning surveys and formal consultation with the Service, if required, would continue north of this area.

Effects of the Proposed Action on the Listed Species

Species Account

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened through publication of the final rule. The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. Generally, desert tortoises are active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping the extreme weather conditions of the desert.

Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), and Weinstein et al. (1987).

The dominant plant communities within the cantonment areas are creosote bush scrub, halophytic saltbush scrub, and xerophytic saltbush scrub. Arid phase saltbush scrub, consisting primarily of allscale (Atriplex polycarpa), occurs over most of the area covered by this biological opinion. Common plant species in the creosote scrub community include creosote (Larrea tridentata) and burrobush (Ambrosia dumosa). Halophytic saltbush scrub occurs only at the edge of Rogers Dry Lake in the southern portion of the action area.

Robert W. Wood (1-6-91-F-28) 4

Development of new facilities within desert tortoise habitat would pose similar threats to individuals and their habitat as routine maintenance. However, the development of a new facility is generally a well-defined action occurring within a specified time-frame that is mandated by agreements with contractors. As such, the stipulations developed for a formal consultation and contained in a specific biological opinion are more applicable to these actions. Continuation of this method of reducing take would be appropriate for future actions occurring in the northern portion of the cantonment area.

The surveys detected few signs of desert tortoises in the southern portion of the action area. This information indicates that few desert tortoises occupy the southern area. Therefore, new development and routine maintenance of existing facilities in this area has a smaller likelihood of taking desert tortoises and their habitat.

The Air Force intends to continue surveys for desert tortoises and initiate formal consultation with the Service, when they are detected, in the northern portion of the cantonment area. This procedure should ensure that the take of desert tortoises and their habitat associated with actions in this area is reduced as much as possible.

The Service believes the impacts described above will not jeopardize the continued existence of the species. We present this conclusion for the following reasons:

1. The area to be disturbed as a result of the proposed action is restricted in size and has been highly fragmented by previous actions.

2. The description of the proposed action includes mitigation measures which will reduce the take of individual desert tortoises.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions that are reasonably certain to occur in the project area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project.

Many of the actions that are reasonably expected to occur within the vicinity of the action will be subject to formal consultation, as mandated by section 7 of the Act, because the Air Force manages all of the surrounding land or leases it to tenants, such as the National Aeronautics and Space Administration. However, actions of individuals, particularly when engaging in recreational activity, are likely to continue contributing to habitat degradation and loss in the area through use of off-highway vehicles.

Incidental Take

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting,

Robert W. Wood (1-6-91-F-28) 5

Terms and Conditions

These terms and conditions are established to implement the reasonable and prudent measure described above. These terms and conditions apply only to the cantonment area south of Mojave Boulevard, noted on the enclosed map:

1. An education program on the desert tortoise and its status as a listed species shall be developed and presented to all base personnel, including contractors and civilian and military employees of the Air Force. The Air Force shall develop this education plan within 60 days of the receipt of this biological opinion and submit it to the Service for review. This program shall be presented to all personnel within one year of the receipt of the approved education program from the Service. In the interim before receipt of the approved plan, all contractors and civilian and military employees of the Air Force shall be informed of the presence of the desert tortoise and its status as a threatened species prior to initiating any work activities within desert tortoise habitat. Alternatively, individual workers could be trained and the project specific educational programs eliminated or reduced in scope, if the same personnel routinely work in this portion of the cantonment area. The workers shall be informed that the Environmental Planning and Compliance Branch must be notified immediately upon discovery of a desert tortoise.

2. If any desert tortoise burrows are encountered, they shall be avoided to the maximum extent feasible. If avoidance is not possible, a biologist from the Environmental Planning and Compliance Branch shall excavate the burrows. Burrow excavation shall be conducted with hand tools only.

3. Construction and maintenance areas shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of work activities. All workers shall be instructed that their activities must be confined to locations within the fenced, flagged, or marked areas.

4. All pre-construction activities (e.g., driving off an established road, clearing vegetation, etc.) within the cantonment area south of Mojave Boulevard noted on the enclosed map shall be conducted in a manner that would minimize the take of desert tortoises. When travelling off-road, speed limits shall not exceed 5 miles per hour and shrubs shall be avoided as much as possible. All desert tortoises and their burrows shall be avoided during these activities. Any hazards to desert tortoises that may be created by this activity, such as auger holes or any steep-sided depressions, shall be checked three times a day for desert tortoises. These hazards shall be eliminated each day prior to the work crew leaving the site. All pre-construction activities occurring north of Mojave Boulevard would remain subject to individual formal consultations.

5. Desert tortoises which are found within the project area during construction shall be moved out of harm's way. If a desert tortoise is found in a burrow, the desert tortoise shall be moved up to 250 feet from where it was found and placed in a natural burrow of similar shape and size. If a natural burrow is unavailable, the desert tortoise shall be

working days of its finding. Written notification must be made within 5 calendar days and include the date, time, and location of the carcass, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The Air Force shall endeavor to place the remains of intact desert tortoises with educational or research institutions holding the appropriate State and Federal permits per their instructions. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place. The Air Force should consider marking the carcass in a manner that would not be toxic to other wildlife to ensure that it would not be re-recorded in the future.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by the Air Force through a biologist prior to implementation of the action. Injured animals should be transported to a qualified veterinarian. Should any treated tortoises survive, the Service should be contacted regarding the final disposition of the animals.

Conservation Recommendations

In furtherance of the purposes of the Endangered Species Act (sections 2(c) and 7(a)(1)) that mandate Federal agencies to utilize their authorities to implement programs for the conservation of listed species, we recommend the following actions:

1. The Air Force should establish a program to revegetate all project areas after the completion of the action. This program should include, at a minimum, respreading of topsoil and seeding with appropriate native plant species.

2. The Air Force should initiate formal consultation with the Service to consider the impacts on the desert tortoise of routine maintenance and small construction projects throughout the entire base. The consultation process should include the development of general measures that would reduce the take of desert tortoises and their habitat during Air Force activities and consideration of programmatic activities that the Air Force could undertake to promote the recovery of the desert tortoise.

Conclusion

This concludes formal consultation on routine operations and facility construction within the cantonment areas of the Main and South Bases, Edwards Air Force Base. Reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is reached; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may

Literature Cited

Arizona Game and Fish Department, California State Resource Agencies, Nevada Department of Wildlife, Utah Division of Wildlife Resources, United States Department of the Interior, Bureau of Land Management, Fish and Wildlife Service. 1990. Protocols for handling live tortoises. In: Interim techniques handbook for collecting and analyzing data on desert tortoise populations and habitats. In: procedures for Endangered Species Act compliance for the Mojave desert tortoise. United States Department of the Interior, Fish and Wildlife Service. 1990. Regions 1, 2, and 6.

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites by Gopherus agassizii in southern Nevada. Proceedings 1978 Desert Tortoise Council Symposium. pp. 80-111.

Burge, B.L., and W.G. Bradley. 1976. Population density, structure and feeding habits of the desert tortoise, Gopherus agassizii, in a low desert study area in southern Nevada. Proceeding 1976 Desert Tortoise Council Symposium. pp. 51-74.

Computer Sciences Corporation. 1991. Biological Assessment. Volume 1. A study of desert tortoise abundance and habitat. Main and south base areas, Edwards Air Force Base, California. Prepared for Air Force Flight Test Center, Edwards Air Force Base. Contract F04611-87-C-0039.

Hovik, D.C., and D.B. Hardenbrook. 1989. Summer and fall activity and movements of desert tortoise in Pahrump Valley, Nevada. Abstract of paper presented a Fourteenth Annual Meeting and Symposium of the Desert Tortoise Council.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise Gopherus agassizii in California. In: R. B. Bury (ed.). North American Tortoises: Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, D.C.

Weinstein, M., K.H. Berry, and F.B. Turner. 1987. An analysis of habitat relationships of the desert tortoise in California. A report to the Southern California Edison Company.

RGH CV on leave EMX cm

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Ventura Field Office
2493 Portola Road, Suite B
Ventura, California 93003

January 23, 1997

Colonel James H. Doolittle III
Vice Commander
AFFTC/CV
1 South Rosamond Boulevard
Edwards Air Force Base, California 93524-1031

Subject: Biological Opinion for Routine Operations, Construction Projects, Runway Expansion, Maintenance and Operation, and Facility Maintenance of Roads and Utilities at the Jet Propulsion Laboratory and North Base Areas of the Air Force Flight Test Center in Kern, Los Angeles and San Bernardino Counties, California (1-8-96-F-52)

Dear Colonel Doolittle:

This biological opinion responds to your request for formal consultation with the U.S. Fish and Wildlife Service (Service), pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Your request was dated June 7, 1996 and received by us on June 10, 1996. At that time, the Service requested further information prior to initiating formal consultation. The requested information was received by us on July 25, 1996. At issue are the effects that routine operations, construction projects, expansion of the runway, and facility maintenance of roads, utilities, and the runway at the Jet Propulsion Laboratory and North Base areas of the Air Force Flight Test Center in Kern, Los Angeles and San Bernardino Counties, California may have on the desert tortoise (*Gopherus agassizii*), a federally threatened species.

Biological Opinion

It is the opinion of the Service that the proposed actions are not likely to jeopardize the continued existence of the desert tortoise. The proposed actions are not located within critical habitat of the desert tortoise. Therefore, critical habitat would not be affected by the proposed actions.

Colonel James H. Doolittle III (1-8-96-F-52) 2

Description of the Proposed Action

The proposed actions would involve a variety of maintenance, repair and construction activities to support or enhance activities in the Jet Propulsion Laboratory (JPL) and North Base (NB) areas. The construction, routine maintenance and repair activities proposed by the Air Force Flight Test Center (AFFTC) are grouped by the Service into the following project categories.

TYPE 1: CONSTRUCTION AND INSTALLATION OF FACILITIES

Construction and installation of facilities would consist of renovating existing buildings and structures for alternative uses, installation of lighting systems, fences, wires and cables, and construction of small to medium buildings on existing cleared or disturbed areas. Due to restrictions regarding height of objects near the existing airfield, structures would not be of substantial height.

TYPE 2: MAINTENANCE AND INSTALLATION OF UTILITIES

These projects would consist of digging trenches with backhoes or trenchers to install cables and pipelines or to repair existing underground utilities. Above ground utilities would be installed and maintained by standard utility vehicles including bucket trucks, smaller support trucks and large auger vehicles.

TYPE 3: MAINTENANCE OF EXISTING ROADS

These projects would consist of using road graders, backhoes, and other small scale dirt moving equipment to repair and reconfigure existing dirt roads. Hard surfaced roads would be maintained using standard paving and road repair equipment to repair surface defects with concrete or asphalt. Actions may also include grading of shoulders and road embankments, placement of shoulder backing, and striping.

TYPE 4: MAINTENANCE OF RUNWAY

This project would consist of cleaning the runway surface, transportation of asphalt patch materials to repair sites, patching surface imperfections, and repairing or extending the shoulders of the runway.

TYPE 5: ROUTINE RUNWAY OPERATIONS

These operations include normal takeoffs and landings, inspection of the airfield to locate trash and debris, transportation and dispensation of aircraft fuel, and emergency equipment access to the runway.

TYPE 6: REMOVAL, REPLACEMENT AND EXPANSION OF CURRENT RUNWAY

This activity involves the use of heavy equipment to tear up and remove the current runway. The remaining ground and fill material would be prepared for resurfacing. A batch plant (an area to mix the new surfacing material) would be established on the north end of the current runway. A new runway would be laid down, expanding the area covered by the old runway by 1,000 feet on each end. Habitat loss from this activity is estimated to be 10 acres.

The initiation request did not provide a maximum project size nor a maximum cumulative acreage total to establish limits for the biological opinion. Through conversations with AFFTC biologists Mark Hagan and Wanda Deal, the Service concluded that the actions included in this programmatic biological opinion (excluding the runway expansion) will cover individual projects under an acre in size and will not exceed 20 acres of total habitat disturbance. This limit does not apply to the one time project of removal, replacement and expansion of the current runway.

The 's request for consultation contains the following mitigation measures intended to reduce the effects of maintenance, repair, and construction projects on the desert tortoise.

All personnel working within the JPL and NB areas will receive an education program prior to commencement of work or entering desert tortoise habitat. Videos, brochures, books, and briefings may be used in the educational program. The educational program will provide information on the natural history of the desert tortoise, the status of the desert tortoise, and protection measures to be followed during routine operations, facility construction, and maintenance activities. All personnel that receive the education program will sign a statement that they have read, understand, and will follow the protective measures. Copies of these statements will be on file at the Environmental Management Office.

Preactivity surveys will be conducted in areas of desert tortoise habitat by qualified biological monitors. Desert tortoises found in areas which could be affected by operations and projects will be relocated to a nearby safe area. Desert tortoise burrows which are discovered in project or operational areas and cannot be avoided will be excavated by a qualified biological monitor using hand tools only. Should any burrows be occupied when excavated, desert tortoises will be placed in a natural burrow of the same size and orientation. If a natural burrow is not available the biological monitor will excavate an artificial burrow and place the desert tortoise inside.

Immediately after each project located in desert habitat, a qualified biologist will conduct a survey to document the amount of habitat disturbance. All disturbed habitat with the JPL and NB areas will be revegetated with native plants if fugitive dust reaches a level which hinders other AFFTC missions.

The 500 by 500 foot area to be disturbed by the establishment of the batch plant for the runway expansion and any access which may have been graded would be returned to their original contours and revegetated using native vegetation and methodologies which have shown to be effective.

A biological monitor will be available during projects and operations which may result in take of desert tortoises. The base wildlife biologist will determine which activities require biological monitoring. Projects and operations which take place during periods of desert tortoise inactivity or in areas not deemed as habitat will not be required to have biological monitoring. The base biologist will make the determination if part time biological monitoring is appropriate.

All project and operational areas will be clearly fenced, flagged, or marked at the outer boundaries to define the limit of activities. Parking and operational areas include vehicle parking and equipment staging sites. All participants will be instructed to confine their activities within the designated areas. If desert tortoise exclusionary fencing is used to delineate project and operational areas, preactivity surveys and a biological monitor will not be required. All open excavations left unattended will be backfilled, covered, or otherwise altered to prevent desert tortoises from becoming trapped within them.

All participants, workers, and visitors to project and operational areas will inspect under vehicles prior to operating them. If desert tortoises are discovered under parked vehicles, the biological monitor will be notified immediately so animals can be relocated to a nearby, safe location.

All trash and food items will be promptly contained and regularly removed from project and operational areas to reduce the attractiveness of the areas to common ravens (*Corvus corax*) and other desert tortoise predators.

All projects and operations which occur between dusk and dawn will be limited to areas which have already been cleared of desert tortoises by authorized biological monitors or previously graded. Construction activities will not be permitted between dusk and dawn in areas supporting native vegetation. These requirements for dusk to dawn activities will not be imposed for areas which are enclosed by desert tortoise exclusion fencing and cleared by qualified biological monitors.

Vehicles will remain on previously established roads as much as possible. Prior to traveling off road, a survey will be conducted by the vehicle operator or other personnel. Desert tortoises or burrows will be avoided if at all possible. If desert tortoises or burrows cannot be avoided then the base biologist will be contacted prior to driving off an established road. As necessary, the base wildlife biologist will handle desert tortoises or excavate burrows as described above.

The AFFTC will submit an annual report to the Service. This annual report will include the number of maintenance and construction projects undertaken and the amount of habitat disturbance involved. The report will also provide the number of desert tortoise mortalities, the

number of animals handled and relocated, and the success of the protection measures which have been implemented.

Effect of the Action on the Listed Species

Species Account

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from two to eight inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Turner 1982, and Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Live desert tortoises have been found in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of about 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened. The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994. Following the recommendations of the desert tortoise recovery team, the final rule designating critical habitat established six Recovery Units over the range of the Mojave population of the desert tortoise. Within Recovery Units, the Service defined at least one Critical Habitat Unit patterned after the Desert Wildlife Management Area concept recommended by the recovery team. A final recovery plan for the desert tortoise was published by the Service in June, 1994.

The recovery plan is the basis and key strategy for recovery and delisting of the desert tortoise (Service 1994). The plan divides the range of the desert tortoise into six distinct population segments or recovery units and recommends establishment of 14 Desert Wildlife Management Areas throughout the Recovery Units. Within each Desert Wildlife Management Area, the

recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. As part of the actions needed to accomplish recovery, land management within all Desert Wildlife Management Areas should restrict human activities that negatively affect desert tortoises (Service 1994). The plan identifies a number of paved routes (including Highway 395) in Desert Wildlife Management Areas along which vehicle-strikes are a significant source of desert tortoise mortality. To reduce this source of mortality, the plan recommends that portions of these routes be fenced to exclude desert tortoises.

The project area in the Jet Propulsion Laboratory and North Base section of AFFTC contains primarily a creosote bush scrub community which is dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). The area supports a number of buildings and facilities currently in place which are spaced such that habitat is present in the intervening areas. This habitat is fragmented but not substantially degraded. The exact project area has not been surveyed for desert tortoise density. Surveys in adjacent areas indicate a density ranging from 10 to 22 desert tortoises per square mile.

Analysis of Effects

Individual desert tortoises within the project area may be subject to injury or death as a result of crushing by construction vehicles or equipment in the project area or by straying of vehicles or equipment into habitat outside of the area. Desert tortoises could become trapped in steep-sided excavations left as a result of work activity. Individual desert tortoises could be taken by predators, such as common ravens and coyotes (*Canis latrans*) that can be attracted to the site by human activities. Uninformed workers could also collect or vandalize desert tortoises that they may encounter when in the project area. Noise generated at work sites could damage the ears of desert tortoises or it may cause them to leave the area. Desert tortoises that are moved as a result of the proposed activities could be at risk if their burrows were destroyed by project activities or if they void their bladders while being handled and are subsequently unable to extract sufficient moisture from food or drinking sources. Cumulatively, approximately 26 acres of habitat of the desert tortoise may be disturbed temporarily or permanently by the proposed actions.

The habitat that would be lost during the maintenance and construction of facilities covered under this biological opinion would be in an area that has been fragmented by human activities. The exception is the habitat that would be lost due to the construction of the new runway. The batch plant needed for construction of the new runway is currently planned for a 500 by 500 foot section (approximately 5.7 acres) at the east end of the expanded runway project area. This area is not as degraded as other proposed project areas. The has proposed to return this area to its previous contours and revegetate it with native plants. Revegetation in the desert ecosystem is a slow process and one in which success is largely unproven. Successful revegetation of the batch plant area (a large area by desert revegetation standards) is likely to be an expensive proposition and will require years of monitoring. Given the justifiable concern over dust and blowing debris in the immediate area of the runway, the Service recommends that the AFFTC thoroughly

examine the project area for previously disturbed sites on which to assemble the batch plant. Only after exhausting all such alternatives should habitat be cleared to place the batch plant adjacent to the runway.

The mitigation measures AFFTC proposes to implement during the subject actions are based upon past technical assistance from the Service. To date, these mitigation measures have minimized habitat loss and prevented project-related take on maintenance and construction activities similar to those proposed in this action.

The Service believes the effects described above are not likely to jeopardize the continued existence of the desert tortoise. We base this conclusion on the following facts:

1. The project description includes mitigation measures that will reduce the take of individual desert tortoises and minimize further degradation of their habitat. Following implementation of similar mitigation measures, many past construction and maintenance actions proceeded without take of desert tortoises.

2. The area to be affected by the proposed construction and maintenance actions contains habitat that has already been fragmented to some degree by past construction and maintenance work and other human activities. Therefore, the proposed action does not increase fragmentation of the desert tortoise populations.

3. The amount of potential habitat that may be disturbed as a result of the proposed activities, approximately 26 acres, constitutes a very small portion of the range of the desert tortoise.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions affecting endangered and threatened species that are reasonably certain to occur in the action area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Endangered Species Act, and therefore are not considered cumulative to the proposed action. Actions that are reasonably expected to occur within Edwards Air Force Base will be subject to section 7 consultations because they will be subject to review by the .

Activities occurring on lands adjacent to Edwards Air Force Base that are managed by the Bureau of Land Management will also be subject to the consultant requirements of section 7. However, activities occurring on adjacent private lands, such as off-highway vehicle use, grazing and residential developments, continue to contribute degradation of desert tortoise habitat in this region of the desert.

The Service has contacted the counties of San Bernardino, Kern, Riverside, Inyo, and Los Angeles (and the incorporated areas within the desert) regarding the listing of the desert tortoise

and its implications for city- and county-permitted activities. Many cities within the range of the desert tortoise in San Bernardino, Los Angeles, and Kern counties have expressed interest in obtaining a section 10(a)(1)(B) incidental take permit from the Service. Regional planning efforts, such as the West Mojave Coordinated Management Plan, could serve as model habitat conservation plans for local governments. Cumulative impacts of future State and private projects will be addressed in regional plans, such as this, and in the section 10(a)(1)(B) incidental take permit process.

Incidental Take

Section 9 of the Endangered Species Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and 7(0)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this incidental take statement. The measures described below as reasonable and prudent measures and terms and conditions to reduce take are non-discretionary, and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

The Service anticipates the following forms of take:

For activities described as Types 1 through 5 in this biological opinion:

1. One (1) desert tortoise per year in the form of direct mortality or injury resulting from construction and maintenance activities.

2. Seven (7) desert tortoises per year in the form of harassment through moving desert tortoises from harm's way during construction and maintenance activities.

For activities described as Type 6 in this biological opinion:

1. Two (2) desert tortoises in the form of direct mortality or injury resulting from removal of the old runway, site preparation, and construction of the new runway.

2. Ten (10) desert tortoises in the form of harassment through moving desert tortoises from harm's way during removal, site preparation, and construction of the runway.

This biological opinion does not exempt from section 9 prohibitions any form of take that is not incidental to the AFFTC's maintenance and construction work covered by this biological opinion.

If the incidental take anticipated by this biological opinion is met, the AFFTC shall immediately notify the Service in writing. If the incidental take authorized by this biological opinion is exceeded, the AFFTC shall cease activities resulting in take and shall reinitiate formal consultation with the Service.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take.

1. Worker education programs and well-defined operational procedures shall be implemented, with the cooperation of on-site qualified biologists, to avoid the take of desert tortoises and minimize loss of their habitat during construction activities.

2. Take of desert tortoises, through injury or death due to the straying of construction and maintenance equipment beyond project areas, shall be reduced through establishment of clearly defined work areas.

3. Take of desert tortoises, through injury or death found within the proposed project area, shall be reduced through the removal of these animals to undisturbed areas adjacent to the construction sites.

4. Attraction of common ravens and other potential desert tortoise predators to project areas shall be reduced to the maximum extent possible.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the AFFTC is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. The following terms and conditions are based on the mitigation measures proposed by AFFTC in its request for formal consultation. Several of the proposed measures are modified herein.

1. Mark Hagan shall act as field contact representative (FCR) for the subject actions. He shall be responsible for overseeing compliance with the terms and conditions of this biological opinion and for coordination on compliance with the project contractors. The FCR shall have the authority to halt all construction activities that are in violation of the terms and conditions.

2. All persons employed on the construction project shall receive instruction regarding the desert tortoise before performing on-site work. Instruction shall include the importance of the desert tortoise to the environment, recovery efforts for the desert tortoise, implications of the Endangered Species Act, and the importance of following all terms

and conditions provided in the biological opinion. Employees shall be notified that they are not authorized to handle or otherwise move desert tortoises encountered on the project site. The AFFTC education program that has been previously approved by the Service may be used to satisfy this term and condition, provided project-specific mitigation measures are fully discussed.

3. Only biologists authorized by the Service shall handle desert tortoises. The Service hereby authorizes the following individuals to handle desert tortoises and conduct pre-activity surveys: Mark Hagan, Wanda Deal, Christopher Rush, Ray Romero, and Ric Williams. The authorized biologist(s) shall have the authority to halt all activity that might result in harm to a desert tortoise. The authorized biologist(s) shall assist in the implementation of on-site mitigation measures for the desert tortoise and monitoring compliance with these terms and conditions. When handling desert tortoises, the authorized biologist(s) shall follow the procedures in "Guidelines for Handling Desert Tortoises During Construction Projects" (Desert Tortoise Council 1994).

4. The area of disturbance shall be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. Work area boundaries shall be delimited with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special habitat features, such as burrows, identified by the qualified biologist, shall be avoided to the extent possible. To the extent possible, previously disturbed areas within the project site shall be used for the storage of equipment, location of office trailers, and parking of vehicles.

5. To the extent practicable, vehicular traffic off existing routes shall be avoided in desert tortoise habitat. Should cross-country use of vehicles prove necessary, an authorized biologist shall survey the route of travel before passage of the vehicle. Before moving vehicles, workers shall inspect beneath vehicles for desert tortoises. If a desert tortoise is present, an authorized biologist shall be responsible for taking appropriate measures to ensure the safety of the animal.

6. The project areas shall be completely surveyed for desert tortoises and their burrows by the authorized biologist(s) before the start of ground disturbing activities. Such site-clearance surveys shall follow the Service's established protocol. All desert tortoises found shall be removed following the guidelines in Desert Tortoise Council (1994).

7. At the discretion of the authorized biologist(s), projects with a potential for take of desert tortoises shall either be monitored by an authorized biologist or temporarily fenced before the onset of ground disturbing activities. Fencing shall be of 0.75 to 1 inch mesh material to prevent entry of desert tortoises. The authorized desert tortoise biologist shall monitor installation of the desert tortoise-proof fence. After fence installation and

removal of any desert tortoises from within the exclosure, an authorized biologist would not be required on-site.

8. All projects and operations which occur between dusk and dawn shall be limited to areas which have already been cleared of desert tortoises by authorized biological monitors or previously graded. Construction activities will not be permitted between dusk and dawn in areas supporting native vegetation. These requirements for dusk to dawn activities are not required for areas which are enclosed by desert tortoise exclusion fencing and cleared by qualified biological monitors.

9. All open excavations left unattended will be backfilled, covered, or otherwise altered to prevent desert tortoises from being trapped in them.

10. All food-related trash items shall be placed in a container which precludes entry by wildlife, such as common ravens and coyotes. Food-related trash shall be regularly removed from the construction site and disposed of at an approved refuse disposal site. Workers shall refrain from deliberate feeding of wildlife.

11. All vehicles engaged in activities addressed by this biological opinion shall be free of fluid leaks. Any non-emergency maintenance that involves fluids or chemicals shall take place in an appropriate area with facilities and materials to deal with spills of common motor vehicle fluids.

12. All grindings and asphaltic-concrete waste shall be stored within previously disturbed areas.

13. If a suitable disturbed site for the runway construction batch plant is unavailable, the shall formulate a revegetation plan for successfully returning the disturbed area to typical desert habitat condition. This plan shall use the best information available for re-establishing native vegetation, include a multi-year monitoring program, and shall begin when surface disturbing activities are completed.

14. To facilitate revegetation of sites where excavation proves necessary, preceding excavation, topsoil and existing ground covers, slash, and limbs of shrubs (if uncontaminated) shall be cleared and stockpiled within the disturbance area. These materials shall be bladed to the outside of the work area or otherwise separated from other excavation spoil and stockpiled to preserve seedbank material. At project completion, stockpiled topsoil followed by slash materials shall be spread over sites with suitable equipment.

Reporting Requirements

The AFFTC shall submit an annual report to the Service. This annual report will include the number of maintenance and construction projects undertaken, the amount of habitat disturbance involved and progress on revegetation efforts. The report will also provide the number of desert tortoise mortalities and injuries, the number of animals handled and relocated, and the success of the protection measures which have been implemented.

Disposition of Dead or Injured Tortoises

Upon locating dead or injured desert tortoises, initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance, California (370 Amapola Avenue, Suite 114, Torrance, California 90501) and by telephone and writing to the Ventura Field Office in Ventura, California, (2493 Portola Road, Suite B, Ventura, California 93003, 805/644-1766) within three working days of its finding. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care shall be taken in handling injured animals to prevent additional injury. Injured animals may be released to the wild after receipt of concurrence from the Service. Care shall be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. The remains of desert tortoises shall be placed with the Biological Resources Division, U.S. Geological Survey, 6221 Box Springs Boulevard, Riverside, California 92507 (Contact: Kristin Berry, [909 697-5361]). Arrangements regarding proper disposition of specimens shall be made with the Biological Resources Division by the project monitor prior to implementation of the action.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service offers the following conservation recommendations:

1. The AFFTC should, in a timely manner, complete and implement a Base-wide habitat management and restoration plan. Such a plan could include management guidelines for the protection of entire communities and restoration efforts following Base activities. The plan should include specific recommendations and guidelines for management of the Base's desert tortoise population. Such an approach to managing the Base's biological resources would help reduce the threat to a number of species of special concern [for example, the alkali mariposa lily (*Calochortus striatus*) and desert cymopterus

(*Cymopterus deserticola*)] and thereby reduce the need for listing additional species as threatened or endangered.

2. The AFFTC should consider marking desert tortoises moved from maintenance sites and monitoring the survivorship of desert tortoises that are removed from work areas. This information would be used to develop more successful techniques for moving desert tortoises from harm's way and to more accurately assess take associated with this type of activity. These individuals may be marked using the acrylic epoxy method described in Desert Tortoise Council (1994). Notching of shells is not authorized.

3. If the Base wildlife biologist deems the batch plant site unfit for revegetation, the AFFTC should undertake efforts to restore or revegetate disturbed desert tortoise habitat off-site. Locations for off-site revegetation should be located in areas where little likelihood of future disturbance exits.

The Service requests notification of the implementation of any conservation recommendations so we can be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats.

Conclusion

This concludes formal consultation on the AFFTC's proposal for routine maintenance, construction, and runway expansion activities on the Jet Propulsion Laboratory and North Base in Kern, Los Angeles and San Bernardino counties, California. Reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). As agreed by the Service and the AFFTC, formal consultation would be reinitiated if any individual activities within the Jet Propulsion Laboratory and North Base that exceed one acre of habitat disturbance or if the cumulative amount of disturbance exceeds 20 acres. Any questions or comments should be directed to Doug Laye of the Service's Barstow Office at (619) 255-8844.

Sincerely,

Diane K. Noda

Diane K. Noda
Field Supervisor

REFERENCES

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites by *Gopherus agassizii* in southern Nevada. Proc. 1978 Symp., The Desert Tortoise Council. pp. 80-111.

Burge, B.L., and W.G. Bradley. 1976. Population density, structure and feeding habits of the desert tortoise, *Gopherus agassizii*, in a low desert study area in southern Nevada. Proc. 1976 Symp., The Desert Tortoise Council. pp. 51-74.

Desert Tortoise Council. 1994. Guidelines for Handling Desert Tortoises During Construction Projects. Edward L. LaRue, Jr., editor. San Bernardino, California.

Hovik, D.C., and D.B. Hardenbrook. 1989. Summer and fall activity and movements of desert tortoises in Pahrump Valley, Nevada. Abstract of paper presented at Fourteenth Annual Meeting and Symposium of the Desert Tortoise Council.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. In: R.B. Bury (ed.). North American Tortoises: Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12. Washington, D.C.

Schamberger, M., and F.B. Turner. 1986. The application of habitat modeling to the desert tortoise (*Gopherus agassizii*). Herpetologica 42(1):134-138.

Turner, R.M. 1982. Mohave desertscrub. In: D.E. Brown (ed), Biotic communities of the American Southwest - United States and Mexico. Desert Plants 4(1-4):157-168.

Turner, R.M., and D.E. Brown. Sonoran desertscrub. In: D.E. Brown (ed.). Biotic communities of the American Southwest -United States and Mexico. Desert Plants 4(1-4):181-222.

U.S. Fish and Wildlife Service, 1994. Desert Tortoise (Mojave population) Recovery plan. U. S. Fish and Wildlife. Portland, Oregon. 73 pp. plus appendices.

Weinstein, M., K.H. Berry, and F.B. Turner. 1987. An analysis of habitat relationships of the desert tortoise in California. A report to Southern California Edison Company. Rosemead, California.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Ventura Field Office
2493 Portola Road, Suite B
Ventura, California 93003

March 19, 1997

Colonel James H. Doolittle III
Vice Commander
AFFTC/CV
1 South Rosamond Boulevard
Edwards Air Force Base, California 93524-1031

Subject: Biological Opinion for Development and Operation of Eight Borrow Pits throughout the Air Force Flight Test Center in Kern, Los Angeles and San Bernardino Counties, California (1-8-96-F-56)

Dear Colonel Doolittle:

This biological opinion responds to your request for formal consultation with the U.S. Fish and Wildlife Service (Service), pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Your request was dated September 23, 1996 and received by us on September 26, 1996. At issue are the effects that continued operation and expansion of existing borrow pits and development of new borrow pits at the Air Force Flight Test Center (AFFTC) in Kern, Los Angeles and San Bernardino Counties, California may have on the desert tortoise (*Gopherus agassizii*), a federally threatened species.

Biological Opinion

It is the opinion of the Service that the proposed action is not likely to jeopardize the continued existence of the desert tortoise. The proposed action is not located within and would therefore not affect critical habitat of the desert tortoise.

Description of the Proposed Action

The proposed action would involve a variety of activities to facilitate the operation, expansion and development of borrow pits at the AFFTC. Currently, seven borrow pits are in operation on the AFFTC. Four of these were the subject of and are analyzed by the biological opinion (Service File 1-8-94-F-6) for the Precision Impact Range Area. Those pits are not discussed in this consultation.

Three existing borrow pits identified as Sites A, B, and C are currently operating and are planned for expansion under the proposed action. Five new sites identified as Sites 1, 5, 21, 23, and 28 are proposed for development under the proposed action. The table below provides background information on the borrow pits that are the subject of this consultation. The information included in the table was either present in the consultation request or gathered during electronic mail communication with AFFTC staff.

Site	Condition	Current Size (acres)	Max Proposed Size (acres)	Tortoise Density per mi^2	Plant Community
A	existing	7.4	33.4*	8 - 31	Creosote Bush Scrub
B	existing	<7.5	7.5	15 - 32	Creosote Bush Scrub
C	existing	≈ 28.5	34.0	11 - 20	Saltbush Scrub
1	proposed	0	5.0	5 - 13	Creosote Bush Scrub
5	proposed	0	5.0	11 - 22	Saltbush Scrub
21	proposed	0	5.0	12 - 18	Creosote Bush Scrub
23	proposed	0	5.0	10 - 21	Joshua Tree Woodland
28	proposed	0	5.0	12 - 13	Saltbush Scrub

* Per amendment of proposed action provided to the Service by the AFFTC on February 28, 1997

Large earth moving equipment such as bulldozers would be used to excavate borrow material. Large haul trucks would be used to transport excavated material to various project locations at the AFFTC. Five of the proposed borrow pits would not exceed five acres in size. The amount of material to be excavated from these five borrow pits is estimated to be from 300,000 to 600,000 cubic yards. The estimated amount of material to be removed is based on an assumption that the slope along the sides of the borrow pit would be 1:1 or 1:2. In addition to these five new sites, three borrow pits would continue to be used and would be expanded to approximately 7.5, 33.4, and 34 acres in size. The amount of material to be removed from the 7.5 acre borrow pit is estimated to be from 450,000 to 900,000 cubic yards. The amount of material to be removed from the 34 acre borrow pit is estimated to be from 2,040,000 to 4,080,000 cubic yards. The 33.4 acre pit is expected to yield from 1,830,000 to 3,660,000 cubic yards of material.

Colonel James H. Doolittle III (1-8-96-F-56) 3

The request for consultation contains the following mitigation measures intended to reduce the effects of the development and operation of borrow pits on the desert tortoise. The Service has segmented and numbered the mitigation measures for clarity.

1. All personnel working within the borrow pit areas would receive an education program prior to commencement of work or entering desert tortoise habitat. Videos, brochures, books, and briefings may be used in the educational program. The education program will provide information on the natural history of the desert tortoise, its status, and protection measures to be followed during borrow pit development and operation activities. All personnel that receive the education program will sign a statement that they have read, understand, and will follow the protective measures. Copies of these statements will be on file at the Environmental Management Office.

2. Preactivity surveys would be conducted in areas of desert tortoise habitat by qualified biological monitors. Desert tortoises found in areas which could be affected by borrow pit operations would be temporarily relocated to a nearby safe area. Desert tortoise burrows which are discovered in borrow pit operational areas and cannot be avoided would be excavated by a qualified biological monitor using hand tools only. Should any burrows be occupied when excavated, desert tortoises would be placed in a natural burrow of the same size and orientation. If a natural burrow is not available, the biological monitor would excavate an artificial burrow and place the desert tortoise inside.

3. A qualified biologist would conduct a survey to document the amount of habitat disturbance resulting from borrow pit development. All disturbed habitat would be revegetated with native plants if fugitive dust reaches a level which hinders other AFFTC missions. Revegetation would be based on funding availability.

4. A biological monitor would be available during borrow pit development and operations which may result in take of desert tortoises. The base wildlife biologist would determine which activities require biological monitoring. Borrow pit development and operations which take place during periods of desert tortoise inactivity or in areas not deemed as habitat would not be required to have biological monitoring. The base biologist would make the determination if part time biological monitoring is appropriate.

5. All borrow pit operational areas would be clearly fenced, flagged, or marked at the outer boundaries to define the limit of activities. Parking and operational areas include vehicle parking and equipment staging sites. All participants would be instructed to confine their activities within the designated areas. If desert tortoise exclusionary fencing is used to delineate project and operational areas, preactivity surveys and a biological monitor would not be required. All open excavations left unattended would be backfilled, covered, or otherwise altered to prevent desert tortoises from becoming trapped within them.

6. All participants, workers, and visitors to borrow pit operational areas would inspect under vehicles prior to operating them. If desert tortoises are discovered under parked vehicles, the biological monitor would be notified immediately so animals can be relocated to a nearby, safe location. Vehicles would remain on previously established roads and within the confines of the borrow pits.

7. All trash and food items would be promptly contained and regularly removed from borrow pit operational areas to reduce the attractiveness of the areas to common ravens (*Corvus corax*) and other desert tortoise predators.

8. All borrow pit operations which occur between dusk and dawn would be limited to areas which have already been cleared of desert tortoises by authorized biological monitors or previously graded. Borrow pit activities would not be permitted between dusk and dawn in areas supporting native vegetation. These requirements for dusk to dawn activities would not be imposed for areas which are enclosed by desert tortoise exclusion fencing and cleared by qualified biological monitors.

9. The AFFTC would submit an annual report to the Service. This annual report would include the number of borrow pits developed and the size. The report would also provide the number of desert tortoise fatalities, the number of animals handled and relocated, and the success of the protection measures which have been implemented.

Effects of the Action on the Listed Species

Species Account

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from two to eight inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Turner 1982, and Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Live desert tortoises have been found in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of about 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping

the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened. The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994. Following the recommendations of the desert tortoise recovery team, the final rule designating critical habitat established six Recovery Units over the range of the Mojave population of the desert tortoise. Within Recovery Units, the Service defined at least one Critical Habitat Unit patterned after the Desert Wildlife Management Area concept recommended by the recovery team. A final recovery plan for the desert tortoise was published by the Service in June, 1994.

The recovery plan is the basis and key strategy for recovery and delisting of the desert tortoise (Service 1994). The plan divides the range of the desert tortoise into six distinct population segments or recovery units and recommends establishment of 14 Desert Wildlife Management Areas throughout the Recovery Units. Within each Desert Wildlife Management Area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. As part of the actions needed to accomplish recovery, land management within all Desert Wildlife Management Areas should restrict human activities that negatively affect desert tortoises (Service 1994). The plan identifies a number of paved routes (including Highway 395) in Desert Wildlife Management Areas along which vehicle-strikes are a significant source of desert tortoise mortality. To reduce this source of mortality, the plan recommends that portions of these routes be fenced to exclude desert tortoises.

The proposed borrow pit sites are in a variety of habitats on the AFFTC including creosote bush scrub, saltbush scrub and Joshua tree woodland (refer to previous table). Some of the sites have operating borrow pits and others are relatively undisturbed. The densities of desert tortoises in the project areas vary from 5 to 32 individuals per square mile.

Analysis of Effects

Individual desert tortoises within the project area may be subject to injury or death as a result of crushing by construction vehicles or equipment in the project area or by straying of vehicles or equipment into desert tortoise habitat outside of the area. Desert tortoises could become trapped in steep-sided excavations left as a result of work activity. Individual desert tortoises could be taken by predators, such as common ravens and coyotes (*Canis latrans*), that can be attracted to the site by human activities. Uninformed workers could also collect or vandalize desert tortoises that they may encounter when in the project area. Noise generated at work sites could damage the ears of desert tortoises or it may cause them to leave the area. Desert tortoises that are

moved as a result of the proposed activities could be at risk if their burrows were destroyed by project activities or if they void their bladders while being handled and are subsequently unable to extract sufficient moisture from food or drinking sources.

In conversations with AFFTC staff, the Service questioned the need for 5 new borrow pits of up to 25 total acres when three borrow pits of up to 49 total acres are already in operation. Additionally, the Precision Impact Range Area contains four more borrow pits. The Service requested information on the possibility of expanding the existing borrow pits to meet the needs of the AFFTC rather than establishing new borrow pits. The Service also questioned the close proximity of sites 5 (proposed) and C (existing) which are only two miles apart. The AFFTC indicated that the material withdrawn from one borrow pit may be quite different from the material present at another site and that different construction requires a broad spectrum of borrow material. The Service assumes that this is the case with pits 5 and C. The AFFTC also indicated that to reduce road maintenance, the possibility of spillage, and the cost of hauling, it was desirable to locate a borrow pit near planned construction sites. While the Service understands the efficacy of that approach, we are concerned that this type of planning tends to further fragment the habitat of the desert tortoise on the AFFTC. The consultation package does not indicate whether current planning includes project proponents coordinating with the Environmental Management Office staff to find areas where the material needed for construction may be located in previously disturbed areas.

The AFFTC proposed that disturbed areas will be revegetated with native plants if fugitive dust levels hinder other missions. The AFFTC also indicated that revegetation is not a part of normal borrow pit operation and would occur only when the pit is permanently closed. For these reasons, the use of previously disturbed areas for placement of the new borrow pits would greatly reduce the adverse effects of the proposed action. Revegetation in the desert ecosystem is a slow process and one in which success is largely unproven. Successful revegetation is likely to be an expensive proposition and will require long-term monitoring

Information provided through conversations with AFFTC staff indicates that the level of use and the season of borrow pit use is unpredictable due to the vagaries of projects and funding. Therefore, the effects of vehicle traffic from the borrow pits would vary, depending on the season of use. The potential for haul trucks to strike desert tortoises on adjacent roads would be greatest during the spring and fall activity periods. The potential for vehicle strikes could be reduced by scheduling hauling activities for the winter and summer months.

Scraped borrow pits, which are below the normal grade of the surrounding terrain might hold pooled water after a rain storm. Consequently, desert tortoises might be attracted to the area and could drown if the slopes of the flooded pit are too steep or unstable. Fencing the sites to preclude entry by desert tortoises or leaving the final sides of the pits to enable desert tortoises safe access would eliminate this potential source of mortality.

The mitigation measures the AFFTC proposes to implement during the subject actions are in a large part based upon past technical assistance from the Service. To date, these mitigation measures have minimized habitat loss and prevented project-related take on activities similar to those proposed in this action.

The Service believes the effects described above are not likely to jeopardize the continued existence of the desert tortoise. We base this conclusion on the following facts:

1. The project description includes mitigation measures that will reduce the take of individual desert tortoises and minimize excessive degradation of their habitat. Following implementation of similar mitigation measures, past activities proceeded without take of desert tortoises.

2. The proposed action would affect only a small portion of the range of the desert tortoise.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions affecting endangered and threatened species that are reasonably certain to occur in the action area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Endangered Species Act, and therefore are not considered cumulative to the proposed action. Most of the actions that are reasonably expected to occur within the AFFTC will be subject to section 7 consultation because the Air Force administers use of the lands. Portions of the adjacent lands are public property administered by the Bureau of Land Management and are also subject to the requirements of section 7. Most of the land bordering the AFFTC along the eastern portion of the base is privately owned. Unauthorized off-highway vehicle use, sheep grazing, and urban development in these areas continue to degrade and fragment habitat of the desert tortoise.

The Service has contacted the counties of San Bernardino, Kern, Riverside, Inyo, and Los Angeles (and the incorporated areas within the desert) regarding the listing of the desert tortoise and its implications for city- and county-permitted activities. Many cities within the range of the desert tortoise in San Bernardino, Los Angeles, and Kern counties have expressed interest in obtaining a section 10(a)(1)(B) incidental take permit from the Service. Regional planning efforts, such as the West Mojave Coordinated Management Plan, could serve as model habitat conservation plans for local governments. Cumulative impacts of future State and private projects will be addressed in regional plans, such as this, and in the section 10(a)(1)(B) incidental take permit process.

Incidental Take

Section 9 of the Endangered Species Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is

further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and 7(0)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this incidental take statement. The measures described below as reasonable and prudent measures and terms and conditions to reduce take are non-discretionary, and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

The Service anticipates the following forms of take:

1. One (1) desert tortoise in the form of direct mortality or injury resulting from development and operation of the borrow pits considered in this biological opinion.

2. Ten (10) desert tortoises in the form of harassment through moving desert tortoises from harm's way during development and operation of the borrow pits considered in this biological opinion.

This biological opinion does not exempt from section 9 prohibitions any form of take that is not incidental to AFFTC's development and operation of the borrow pits covered by this biological opinion.

If the incidental take anticipated by this biological opinion is met, the AFFTC shall immediately notify the Service in writing. If the incidental take authorized by this biological opinion is exceeded, the AFFTC shall immediately notify the borrow pit operators to cease activities resulting in take and shall reinitiate formal consultation with the Service.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of desert tortoises.

1. Take of desert tortoises, through injury or death, in the proposed project areas shall be reduced by fully implementing the mitigation measures contained in the AFFTC's request for consultation and repeated in the "Description of the Proposed Action" portion of this biological opinion.

2. The AFFTC shall ensure that desert tortoises are not trapped or drowned in borrow pits that are not in use.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the AFFTC is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above.

1. The following term and condition is established to implement reasonable and prudent measure 1:

   The mitigation measures contained in the AFFTC's request for consultation and repeated in the "Description of the Proposed Action" portion of this biological opinion are hereby incorporated as terms and conditions of this biological opinion and shall be fully implemented by the Air Force.

2. The following term and condition is established to implement reasonable and prudent measure 2:

   When not in active use, the sides of all borrow pits shall be left in a condition that enables desert tortoises to enter and leave the pits. The steepness of the slope and its stability and the ability of desert tortoises to travel across the area shall be considered in the final design of the inactive pit. If providing safe access to desert tortoises is not possible, the AFFTC shall fence all inactive borrow pits to prevent entry by desert tortoises.

Reporting Requirements

The AFFTC shall submit an annual report to the Service. This annual report shall include the number of borrow pits developed and the size. The report shall also provide the number of desert tortoise fatalities, the number of animals handled and relocated, and the success of the protection measures which have been implemented. The report shall also describe the manner in which inactive pits are maintained to prevent entrapment of desert tortoises

Disposition of Dead or Injured Desert Tortoises

Upon locating dead or injured desert tortoises, initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance, California (370 Amapola Avenue, Suite 114, Torrance, California 90501) and by telephone and writing to the Ventura Field Office in Ventura, California, (2493 Portola Road, Suite B, Ventura, California 93003, 805/644-1766) within three working days of its finding. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care shall be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. The remains of intact desert tortoises shall be placed with the Biological Resources Division, U.S. Geological Survey, 6221 Box Springs Boulevard, Riverside, California, 92507, (909) 697-5200. Arrangements regarding the proper disposition of potential museum specimens shall be made with the institution by the AFFTC before implementation of the action.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service offers the following conservation recommendations:

1. The AFFTC should, in a timely manner, complete and implement a Base-wide habitat management and restoration plan. Such a plan could include management guidelines for the protection of entire communities and restoration efforts following Base activities. The plan should include specific recommendations and guidelines for management of the Base's desert tortoise population. Such an approach to managing the Base's biological resources would help reduce the threat to a number of species of special concern [for example, the alkali mariposa lily (*Calochortus striatus*) and desert cymopterus (*Cymopterus deserticola*)] and thereby reduce the need for listing additional species as threatened or endangered.

2. The AFFTC should consider marking desert tortoises moved from maintenance sites and monitoring the survivorship of desert tortoises that are removed from work areas. This information would be used to develop more successful techniques for moving desert tortoises from harm's way and to more accurately assess the incidental take associated with this type of activity.

3. The AFFTC should restrict material hauling from the borrow pits to times of the year when desert tortoises are generally inactive and are less likely to be struck by haul trucks.

4. The AFFTC should attempt to consolidate its use of borrow pits to reduce the fragmentation of habitat of the desert tortoise.

The Service requests notification of the implementation of any conservation recommendations to keep us informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats.

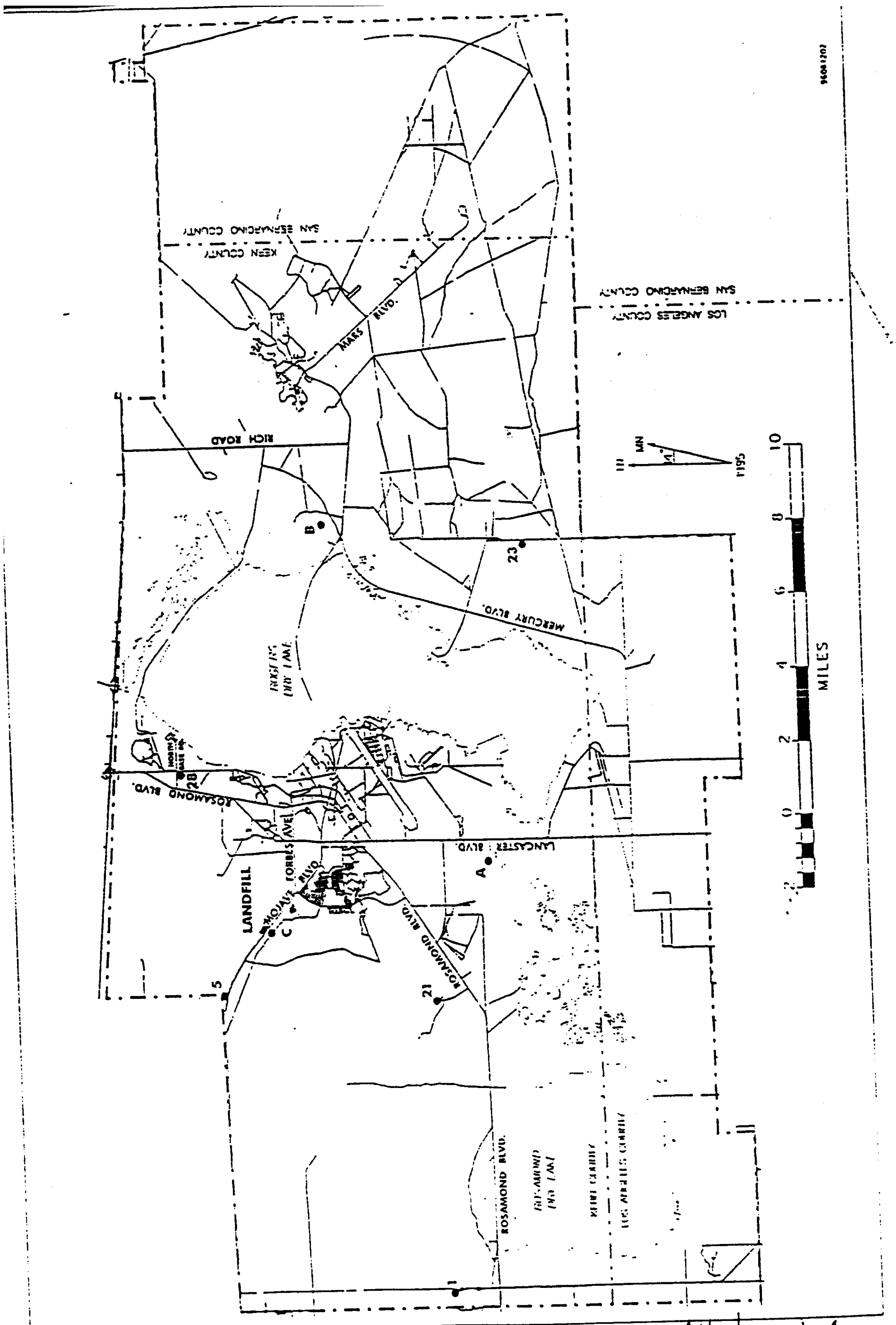
Conclusion

This concludes formal consultation on the proposal for development and operation of eight borrow pits throughout the Air Force Flight Test Center in desert tortoise habitat in Kern, Los Angeles and San Bernardino counties, California. Reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). Any questions or comments should be directed to Doug Laye of the Service's Barstow Office at (619) 255-8844.

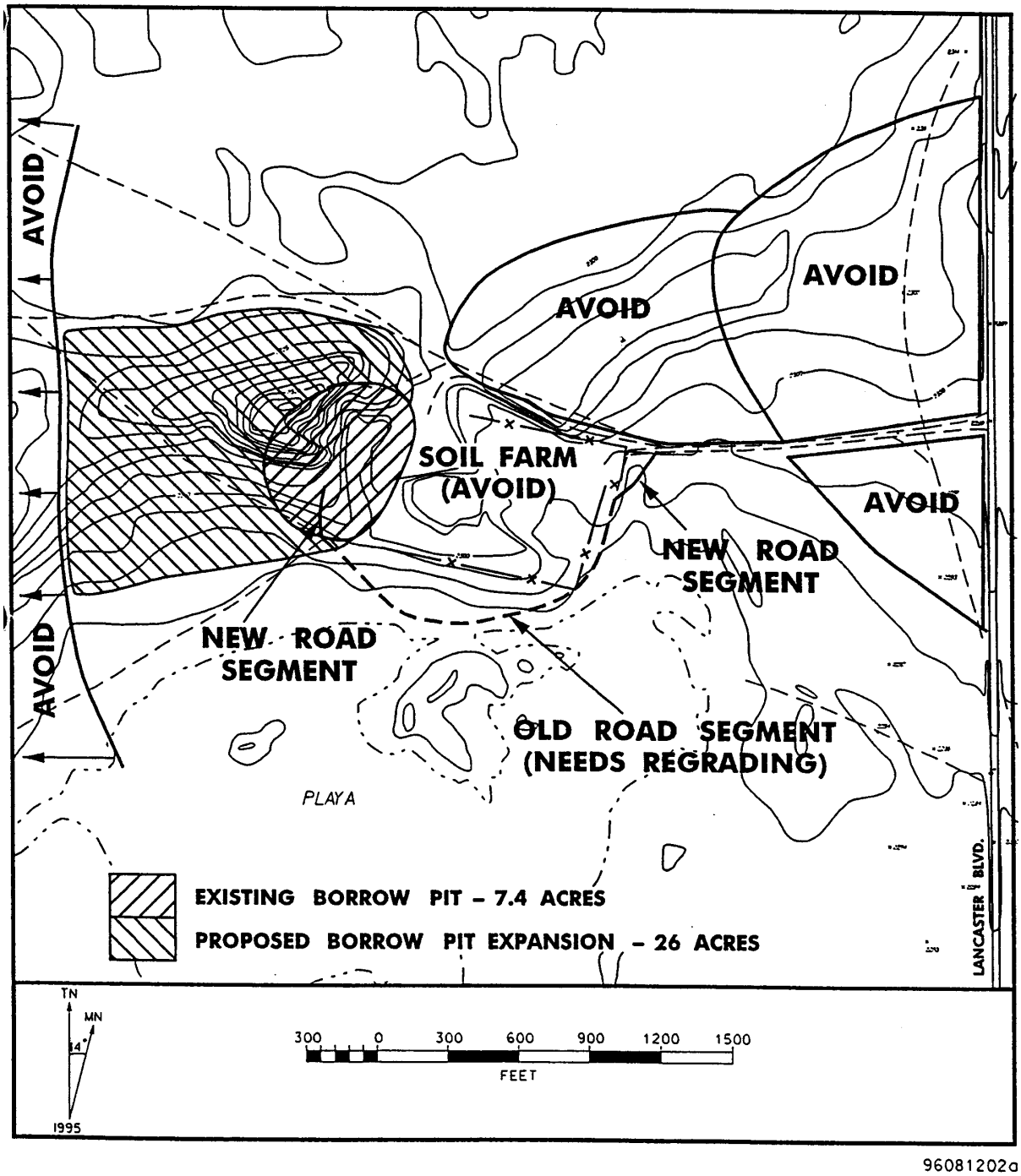
Sincerely,

Diane K. Noda

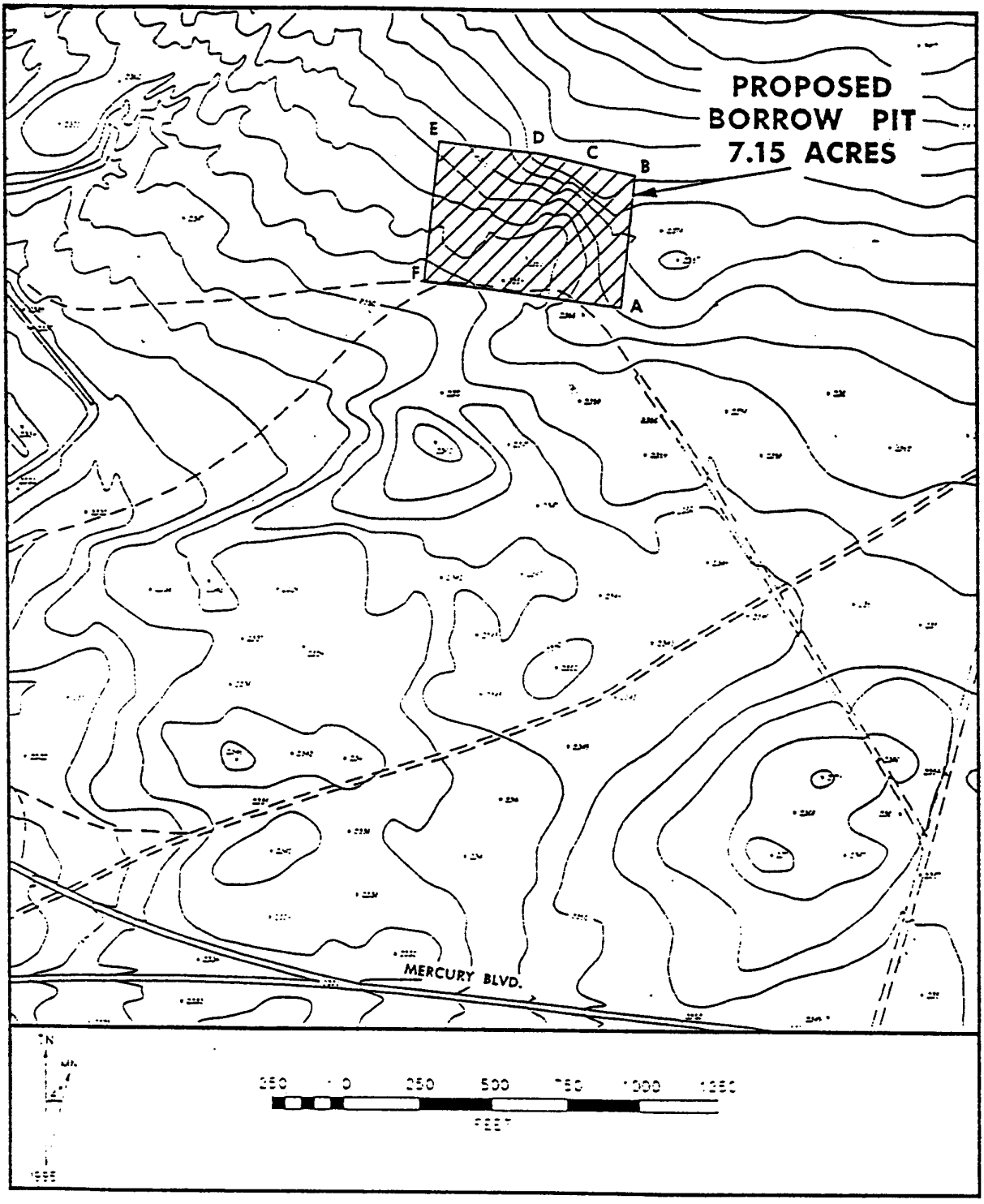
Diane K. Noda
Field Supervisor



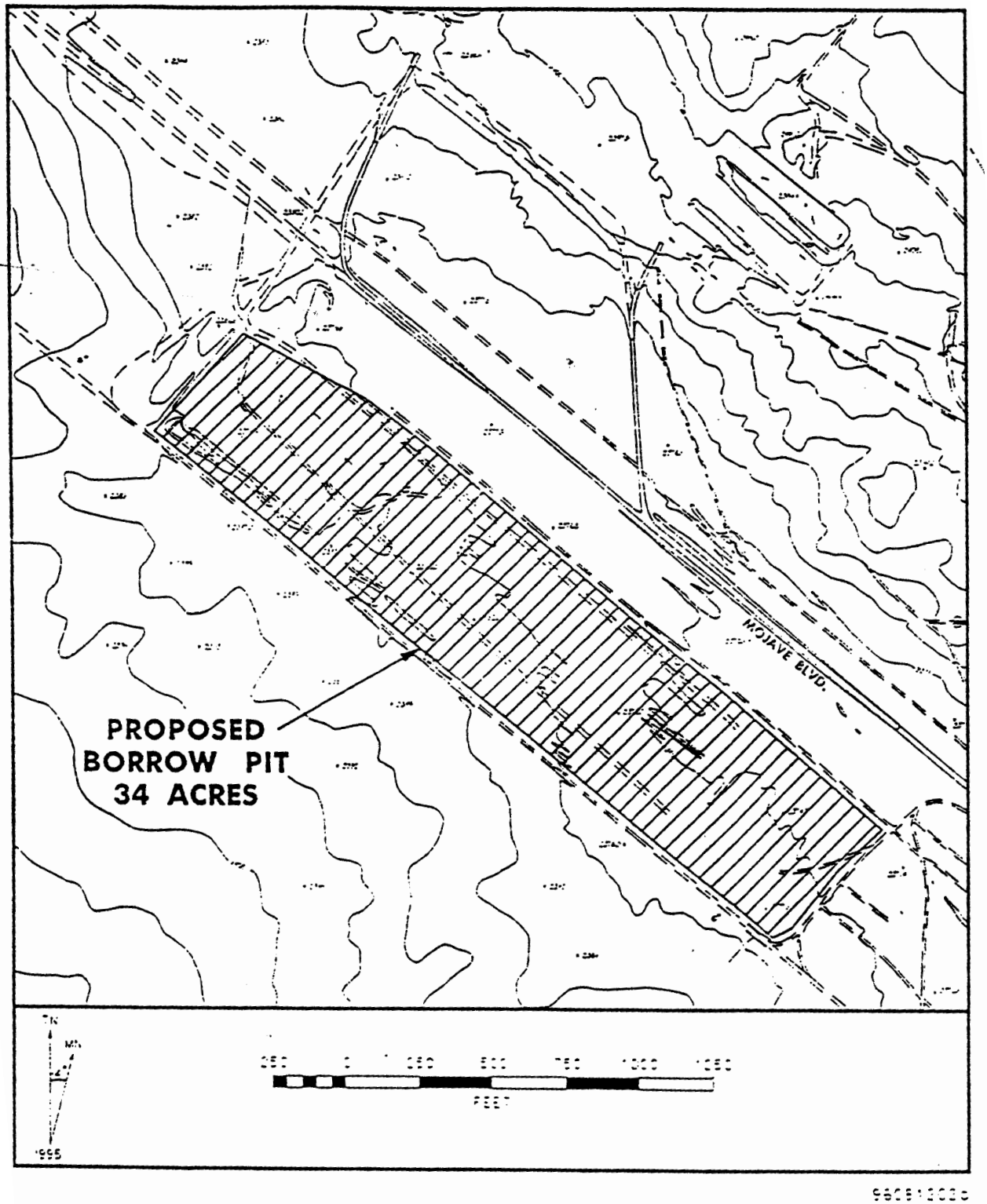
Attachment 1


AVOID
AVOID
AVOID
AVOID
SOIL FARM
(AVOID)
AVOID
NEW ROAD
SEGMENT
NEW ROAD
SEGMENT
AVOID
OLD ROAD SEGMENT
(NEEDS REGRADING)
PLAYA
EXISTING BORROW PIT – 7.4 ACRES
PROPOSED BORROW PIT EXPANSION – 26 ACRES
LANCASTER BLVD.
TN
MN
14°
1995
300 0 300 600 900 1200 1500
FEET
96081202a

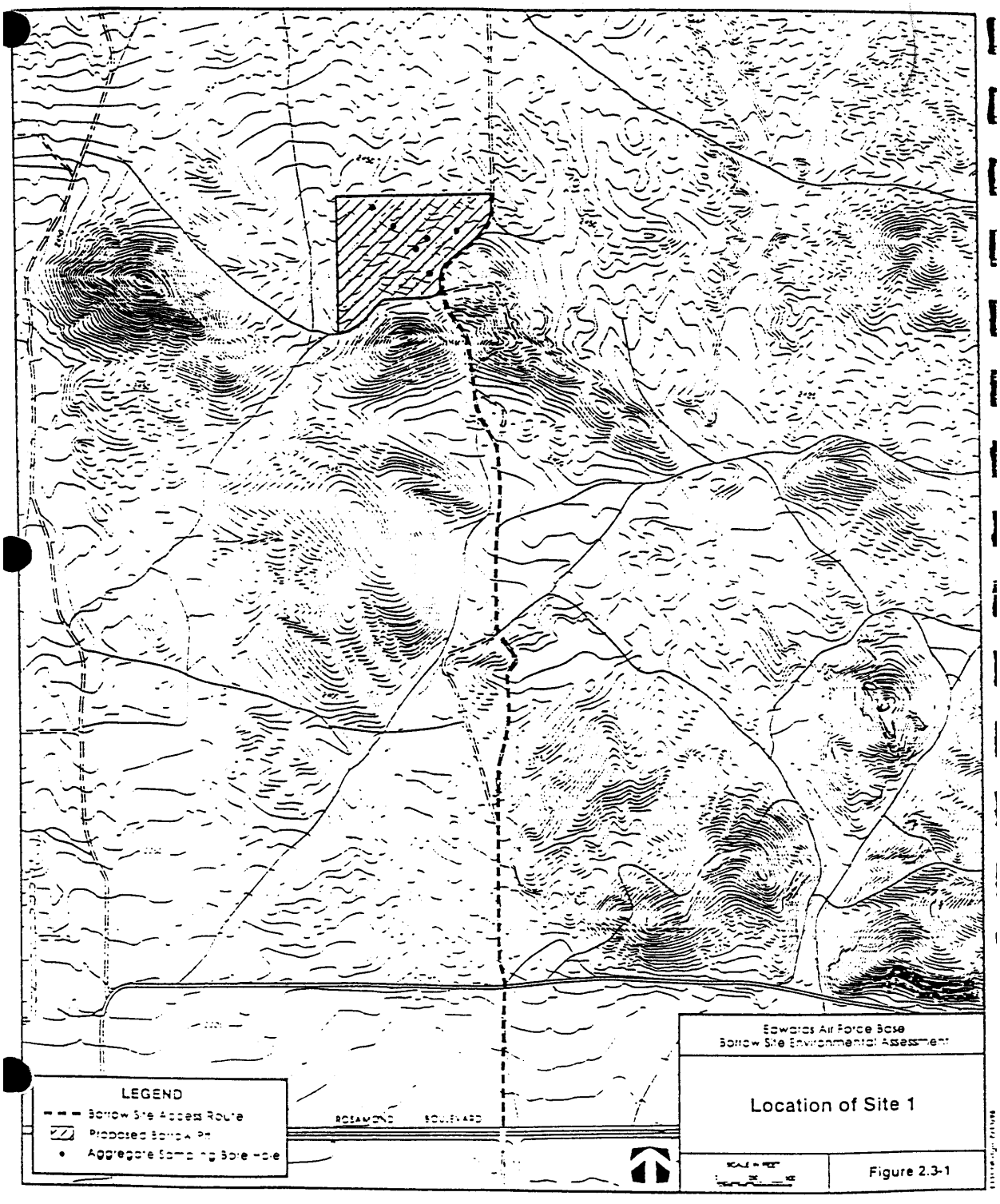
BORROW PIT "A"

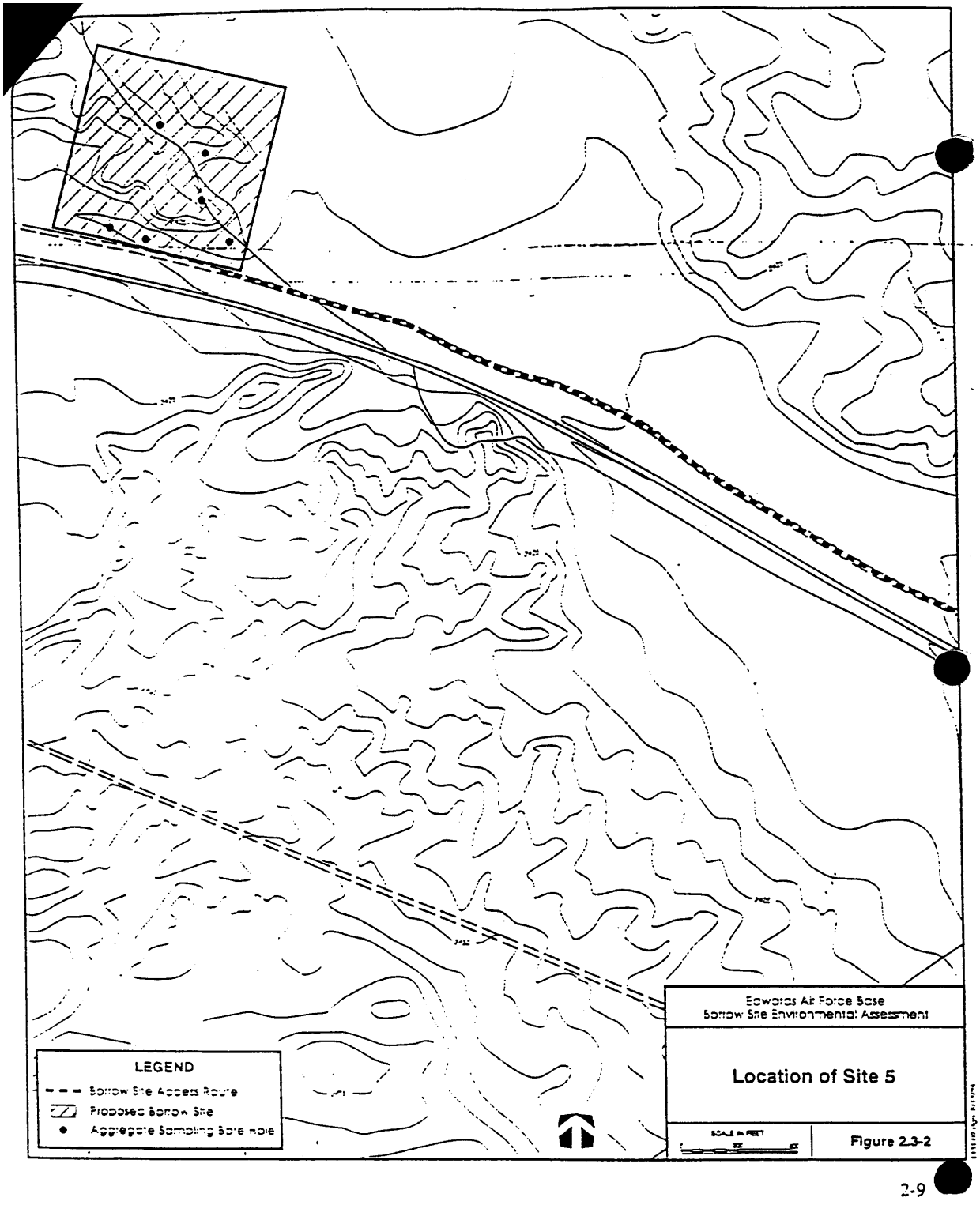

PROPOSED
BORROW PIT
7.15 ACRES
E
D
C
B
F
A
MERCURY BLVD.
250
0
250
500
750
1000
FEET

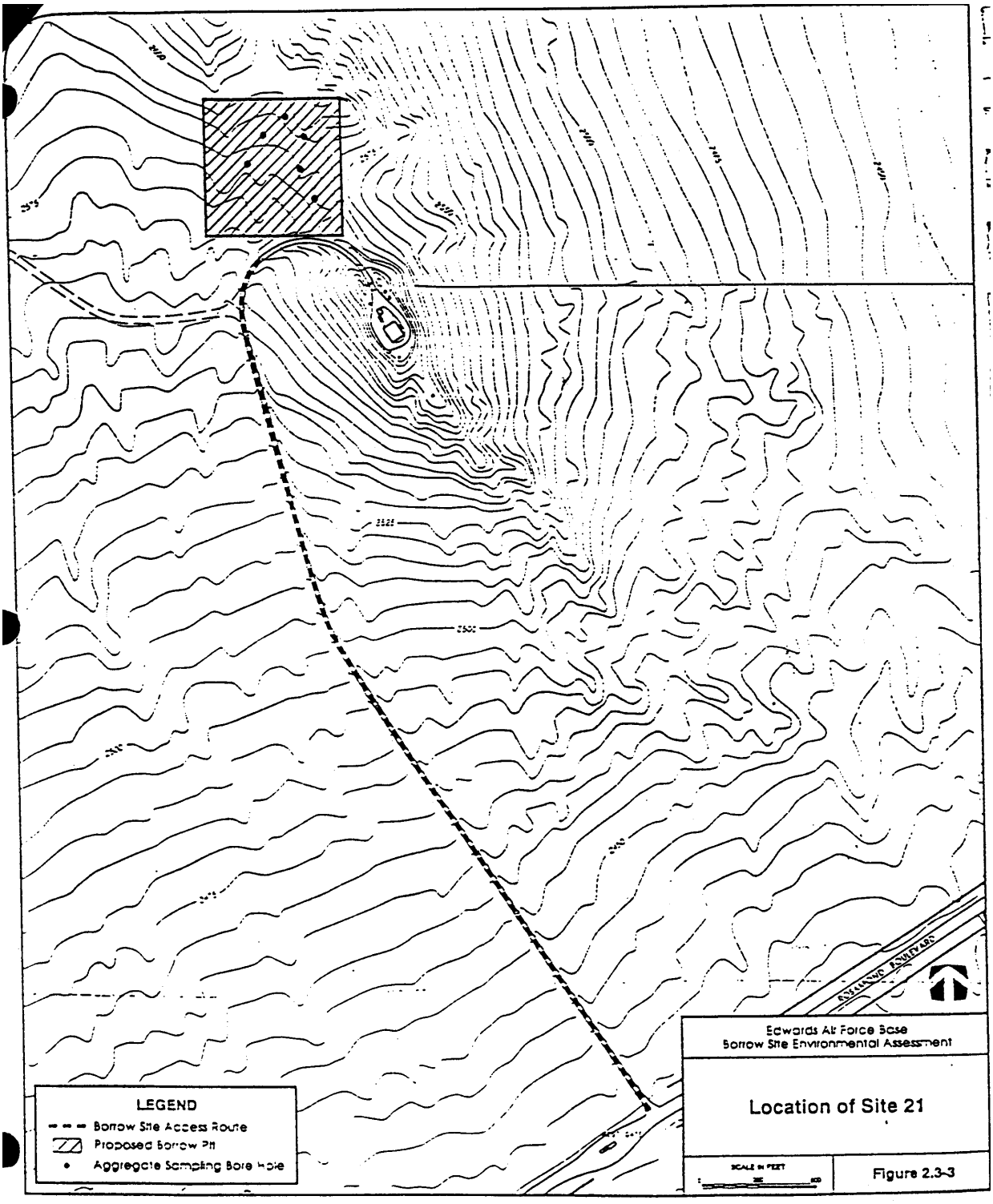
BORROW PIT "B"



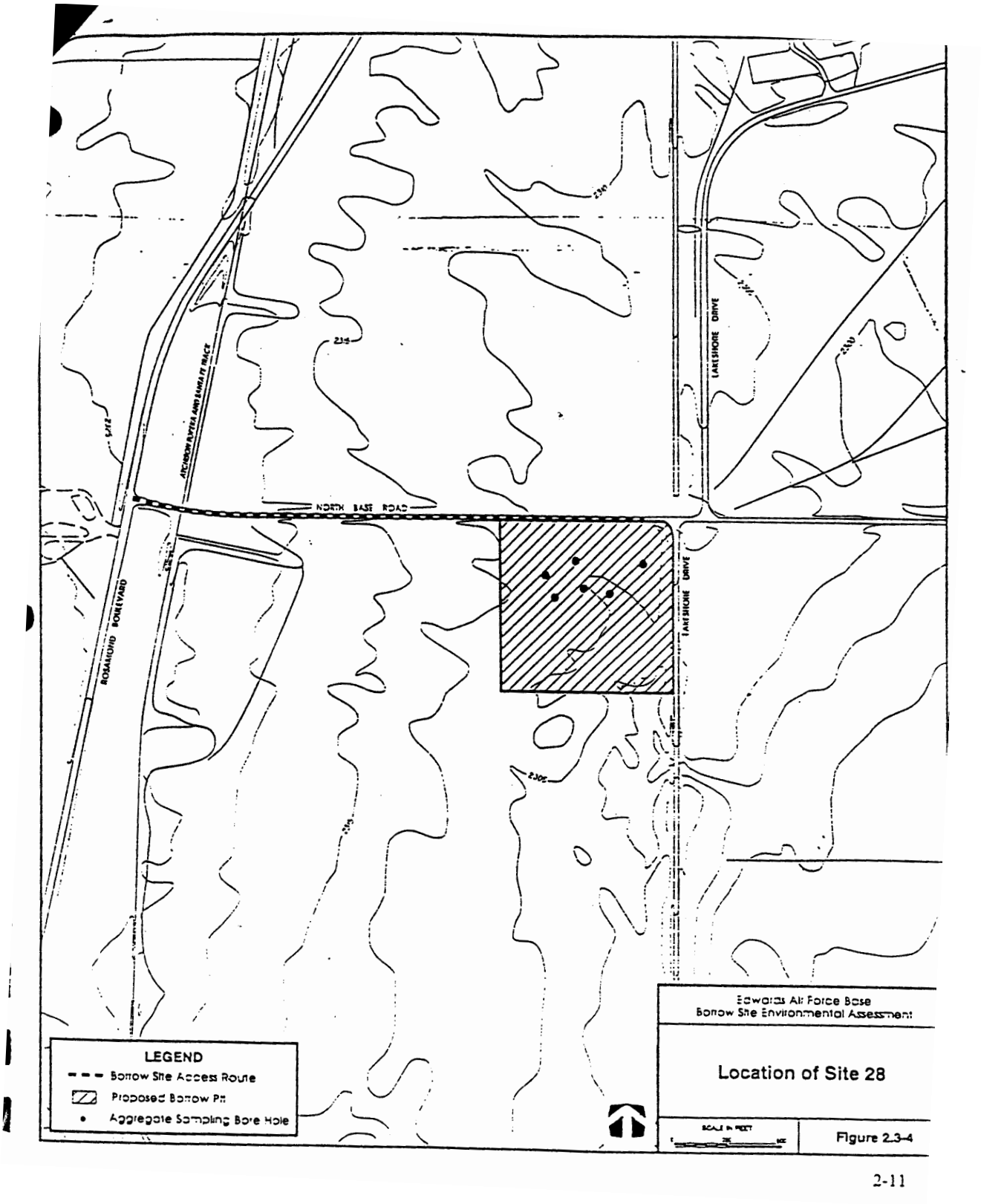
BORROW PIT "C"

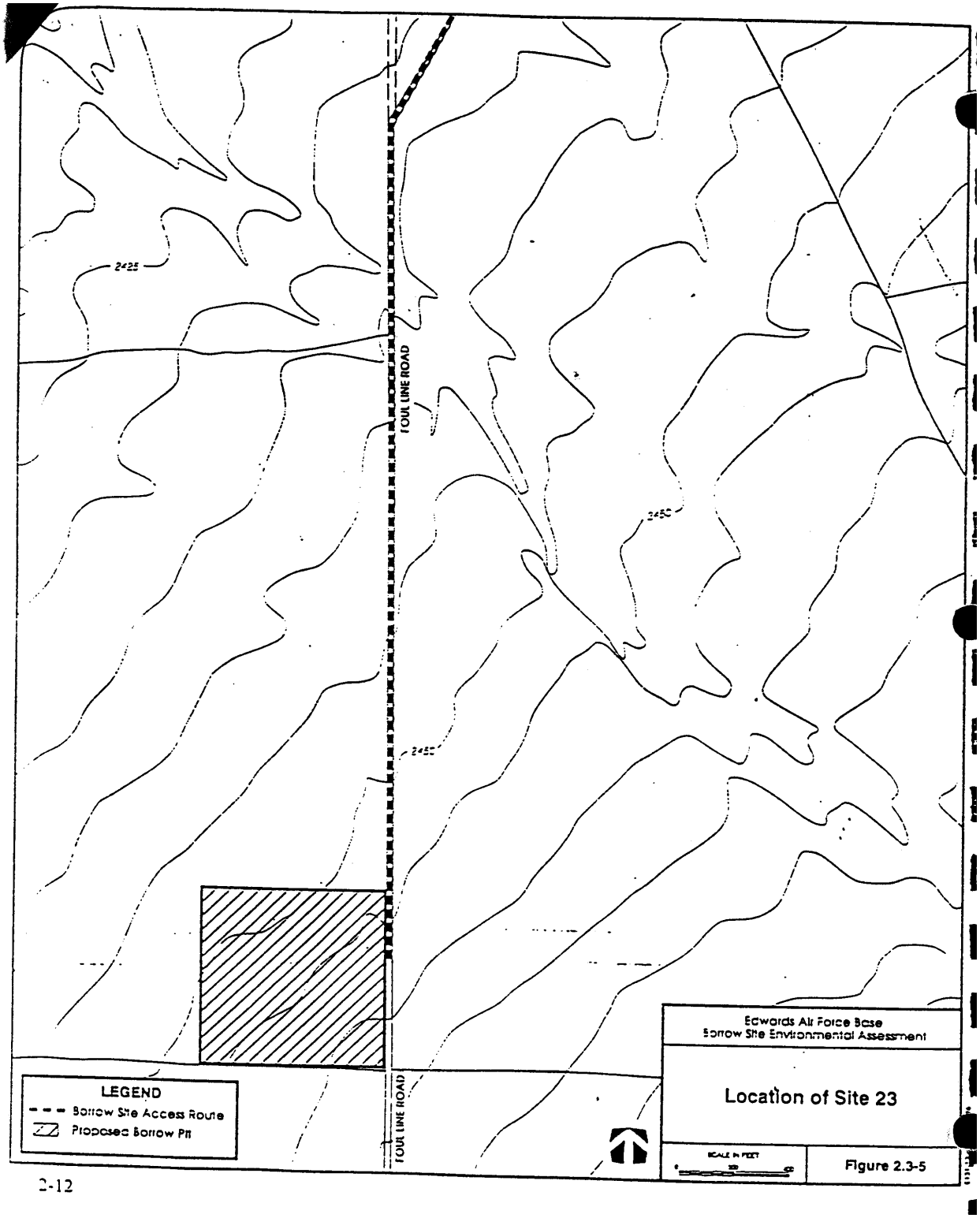

LEGEND
Borrow Site Access Route
Proposed Borrow Pit
Aggregate Sampling Borehole
ROSAMOND BOULEVARD
Edwards Air Force Base
Borrow Site Environmental Assessment
Location of Site 1
Figure 2.3-1


LEGEND
Borrow Site Access Route
Proposed Borrow Site
Aggregate Sampling Bore Hole
Edwards Air Force Base
Borrow Site Environmental Assessment
Location of Site 5
Figure 2.3-2
2-9


LEGEND
Borrow Site Access Route
Proposed Borrow Pit
Aggregate Sampling Bore Hole
Edwards Air Force Base
Borrow Site Environmental Assessment
Location of Site 21
Figure 2.3-3

2-10


NORTH BASE ROAD
ROSAMOND BOULEVARD
LAKESHORE DRIVE
LAKESHORE DRIVE
ATCHISON, TOPEKA AND SANTA FE TRACK
LEGEND
Borrow Site Access Route
Proposed Borrow Pit
Aggregate Sampling Bore Hole
Edwards Air Force Base
Borrow Site Environmental Assessment
Location of Site 28
Figure 2.3-4
2-11


2425
FOUL LINE ROAD
2450
2450
FOUL LINE ROAD
LEGEND
Borrow Site Access Route
Proposed Borrow Pit
Edwards Air Force Base
Borrow Site Environmental Assessment
Location of Site 23
Figure 2.3-5
2-12

APPENDIX E

CLEAN AIR ACT CONFORMITY STATEMENT FOR AIR FORCE FORM 813 CONTROL 95-081AMEND

This page intentionally left blank.

FINAL
DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 95TH AIR BASE WING (AFMC)
EDWARDS AIR FORCE BASE CALIFORNIA

AUG 2 4 2009

MEMORANDUM FOR RECORD

FROM: 95 ABW/EMC
5 East Popson Avenue, Building 2650A
Edwards AFB, CA 93524-1130

SUBJECT: *Clean Air Act* Conformity Statement for *Update to Environmental Assessment for Routine Flightline Activities, Edwards Air Force Base, California.*

1. The following finding is made on the need for a conformity statement under the *Clean Air Act* with respect to the Proposed Action.

a. The Proposed Action is located in the Kern County Air Pollution Control District (KCAPCD).

b. Under regulations promulgated pursuant to the *Clean Air Act*, Title 42 United States Code Part 7506(c), Edwards Air Force Base is located in an attainment/maintenance area for ozone. The *de minimis* level set for this area for emissions of ozone precursor pollutants (volatile organic compounds [VOC] or oxides of nitrogen [NO_x]), in accordance with Title 40 Code of Federal Regulation (CFR) Part 51.853/93.153(b)(1) and KCAPCD Rule 210.7, is up to 100 tons per pollutant (VOCs or NO_x) per year per action.

c. It has been determined that this action qualifies for exemption under 40 CFR 51.853 and 93.153(c)(2)(ii) and (c)(2)(xiii). The exemption is as follows:

(1) Continuing and recurring activities such as permit renewals where activities conducted will be similar in scope and operation to activities currently being conducted.

(2) Routine operation of facilities, mobile assets, and equipment.

d. Individual routine flightline activities would be reviewed and an air conformity analysis would be conducted on a project specific basis by the Environmental Quality Division.

2. Should you have any questions with respect to this finding, please direct them to Mr. Herb Roraback at (661) 277-1478.

Herbert W. Roraback

HERBERT W. RORABACK
Chief, Environmental Quality Division

This page intentionally left blank.